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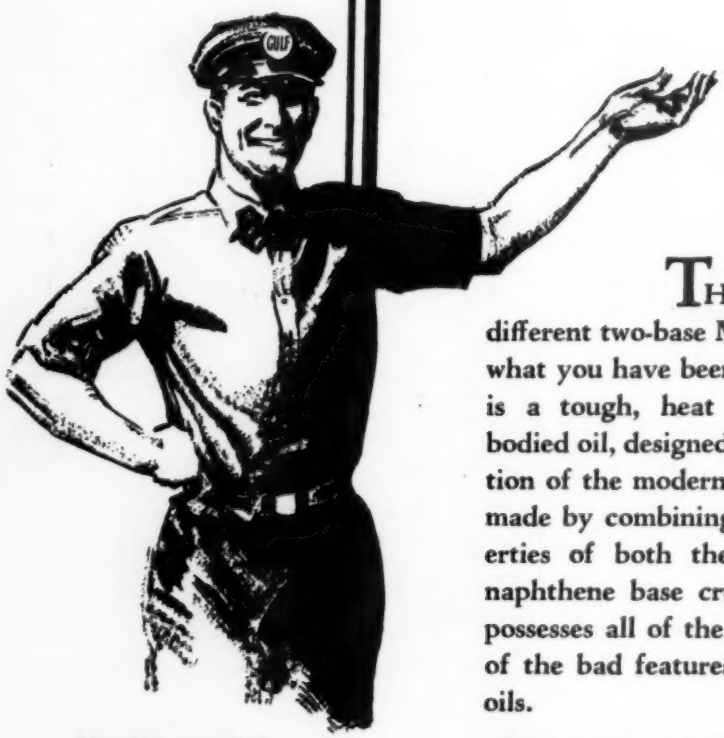

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VIEW OF BLANC MONT, CAPTURED BY THE 2D DIVISION

Photo by U. S. Army Signal Corps

GERMAN OBSERVATION POST IN THE BLANC MONT AREA

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ESSEN TRENCH NORTH OF SOMMEPY NEAR THE MEDEAH FARM ROAD

An ordinary traversed trench, well supplied with dugouts, two panels of wi re, and small field of fire. Evidently more of a trench for supports than a firing trench. Débris indicates hard fighting in this section of the trench.

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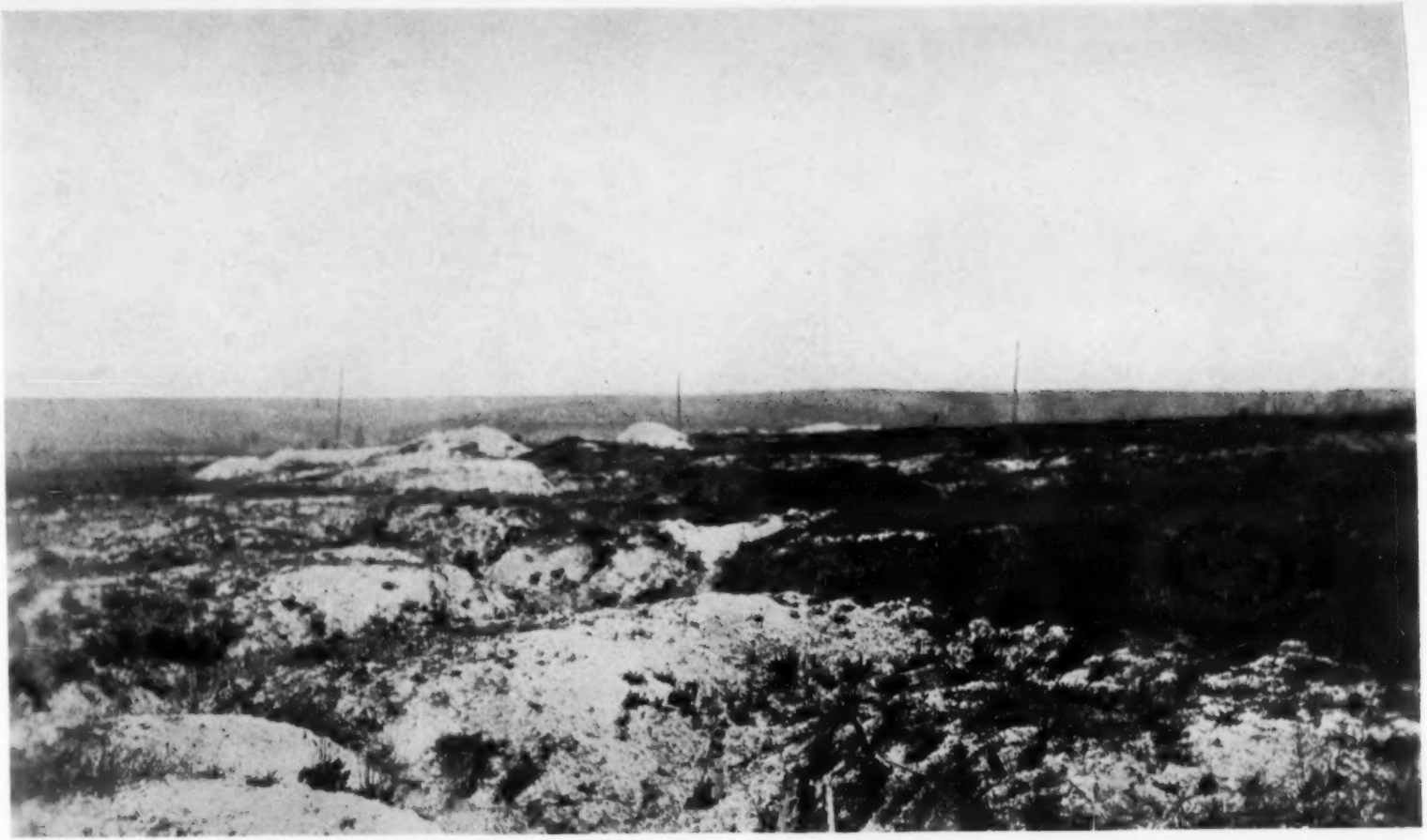

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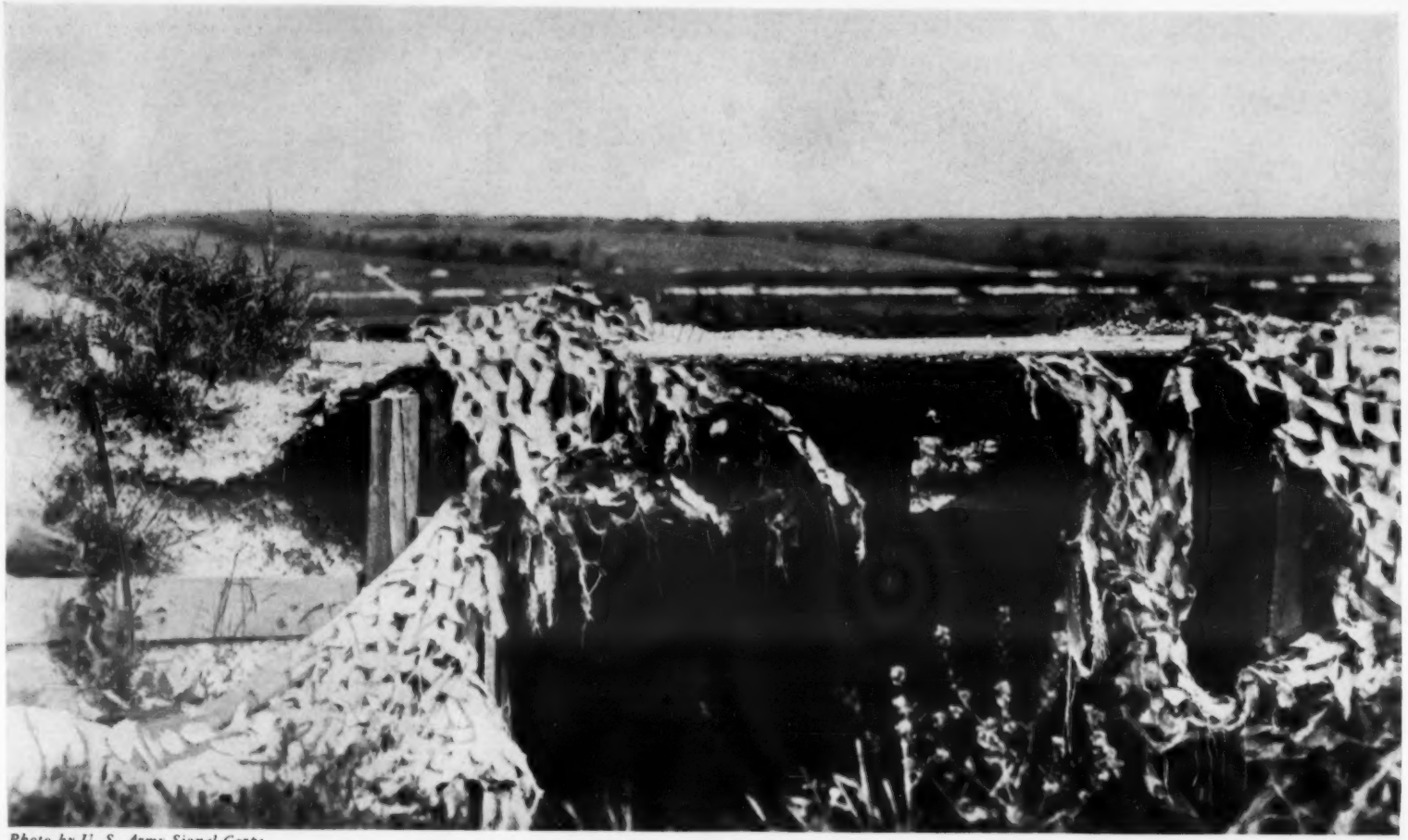
ESSEN TRENCH ON THE SO-CALLED ESSEN HOOK

Still a deep, well-traversed trench, with wires, and with a limited field of fire—a support trench.



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GERMAN DUGOUT ON ESSEN HOOK
Dugout has been reversed for use of Americans.

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GERMAN DUGOUT ON ESSEN HOOK
Dugout has been reversed for use of Americans.

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VIEW EAST FROM ESSEN HOOK

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UNITED STATES
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Vol. No. 56, No. 2 FEBRUARY, 1930 *Whole No. 324*

The Battle *at* Blanc Mont

(*October 2 to October 10, 1918*)

By LIEUTENANT COLONEL ERNST OTTO, *German Army (Retired)*
Translated from the German by MARTIN LICHTENBERG, *U. S. Marine Corps*
Army War College

(Continued from the January issue)

THE FOURTH DAY OF OCTOBER

(See Maps H, J, K, L, M, and N.)

THE commanding general of the American 2d Division, Major General Lejeune, ordered the attack for 7:00 A.M., October 4. Before the execution of this order, however, it was to be ascertained by means of reconnaissance flights whether or not the two adjacent divisions had come abreast of the 2d Division. It was found, at dawn, that the American 9th and also the 23d Regiments had had to ward off German counterattacks. Their efforts were crowned with success, but the casualties of the 23d Infantry were high, especially from German machine-gun fire from the rear. At 3:00 P.M. of the third the 1st Battalion was still located in a number of old German training trenches southeast of Etienne while the 3d and elements of the 2d Battalions protected its flanks. On its right flank it did not have contact with the French 67th Division. On the left, however, the fact that the 5th Marine Regiment during the forenoon had moved forward along the Sommepy–Etienne highway north of Blanc Mont, had somewhat relieved the situation of the threatened French neighbor. Here, during the night of October 3 to 4, the French 22d Infantry Division relieved the 21st Division south of Blanc Mont. It launched an attack, with the "Essen Hook" as the line of departure, in a westerly direction against the north slope of Helenen Hill, forced the German troops facing south on this hill (these were only outposts) to retreat, and thereafter advanced in a northerly direction.

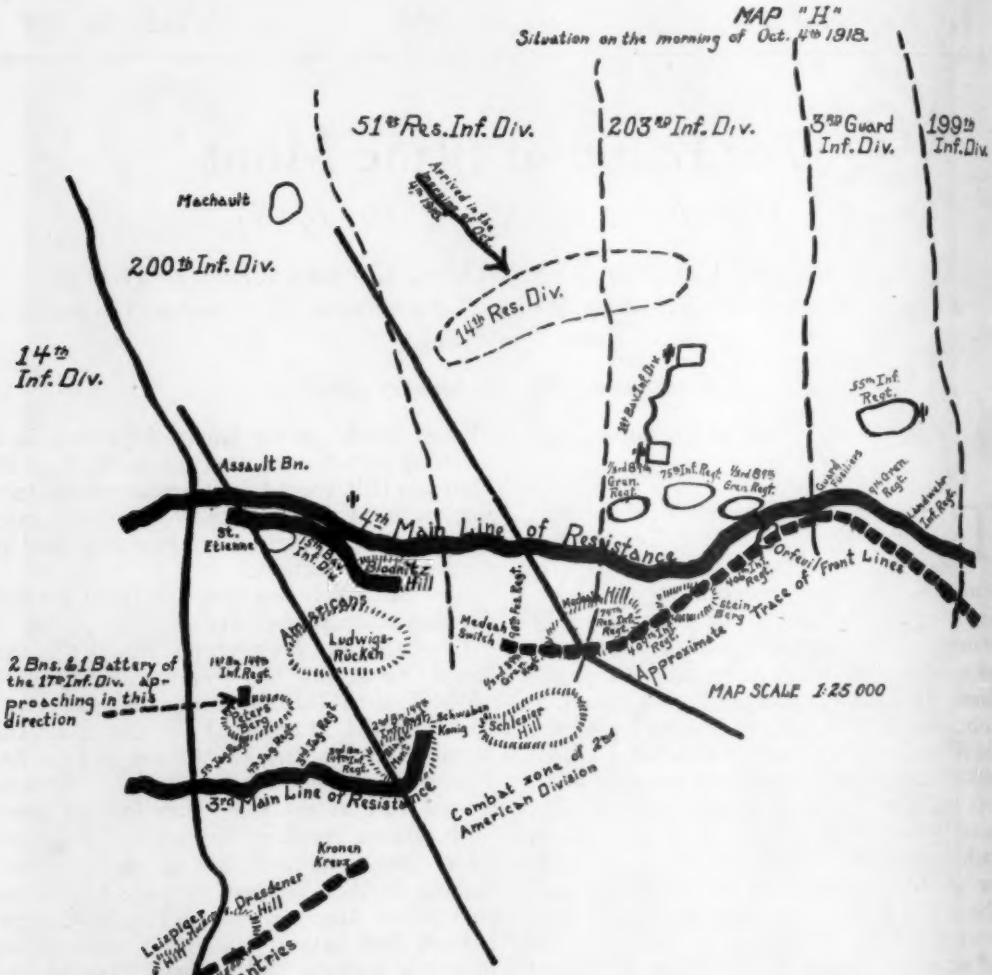
One can safely say that this fresh French division accomplished little.

On page 14, Monograph No. 9, "Blanc Mont Operation," has been printed a report of the French 22d Division to the effect that, on October 4, at about 11:00 A.M. a certain battalion of this division had reached the St. Pierre–St. Etienne road while other French troops were at the same time located close to the Arnes brook southwest of St. Pierre. This report sounds very improbable. For, looking further, we find on page 17 the report of the American liaison officer with the French 22d Infantry Division, who states that this division had advanced not earlier than 8:00 A.M., October 5, and had reached St. Pierre at 11:55 A.M. This report tallies also with the daily reports of the French 21st Army Corps of October 6 (see last page of Monograph No. 9).

I have in fact ascertained that the first-named report is entirely false. Throughout October 4, the 3d, 4th, and 5th Jäger Regiments, connecting in the west with the sector of the 3d Battalion, 149th Infantry Regiment, held their positions. They reported

that the enemy, advancing against their own front, had felt their way forward very carefully and slowly. (Compare Maps K and M.) Connecting with the sector of the Jäger Brigade, the front-line companies of the 2d Battalion, 56th Infantry Regiment, of the 14th Infantry Division, occupied the Regiment which was located northwest of St. Etienne. (See Map K.)

On October 4, the 14th Infantry Division issued orders that, until 12:00 o'clock midnight, decisive combats were to be engaged in for the possession of the Martin switch position, after which the troops were to re-



Martin switch position, while still further west the companies of the 3d Battalion, 16th Infantry Regiment, held Keilberg. In their sector, quiet prevailed through the entire day; they were not even attacked. In addition to that, there existed a flank protection, composed of detachments of the 165th Infantry Regiment, the 1st Battalion, 149th Infantry Regiment, and the Cavalry Rifle

treat. This same division, in its War Diary report of October 5, states that its withdrawal into the Arnes position was carried out without molestation by the enemy.

The combat activities of the French 22d Division on October 4 consisted solely of attacks launched against the sector of the 3d Battalion, 149th Infantry Regiment. Here directly at the west slope of Blanc

Mont, this French division at about 7:00 P.M. succeeded in penetrating our lines, with the result that it gained contact with the American 4th Brigade at a point north of Blanc Mont and closed in on elements of the defending Germans on this hill. When the French 22d Division finally advanced on October 5 there were no Germans in front of it as far back as Arnes brook.

The French 67th Infantry Division, advancing at the right of the American 2d Division, halted about noon in the Orfeuil–Château of Bémont line. It had contact, it is true, with the 9th Infantry which was located in the rear, near Médéah Ferme, but not with the 23d Infantry, further forward in lines.

At 1:00 P.M. it was decided to designate 3:30 P.M. as the zero hour for the attack of the American 2d Division, which had been planned during the forenoon of the same day.

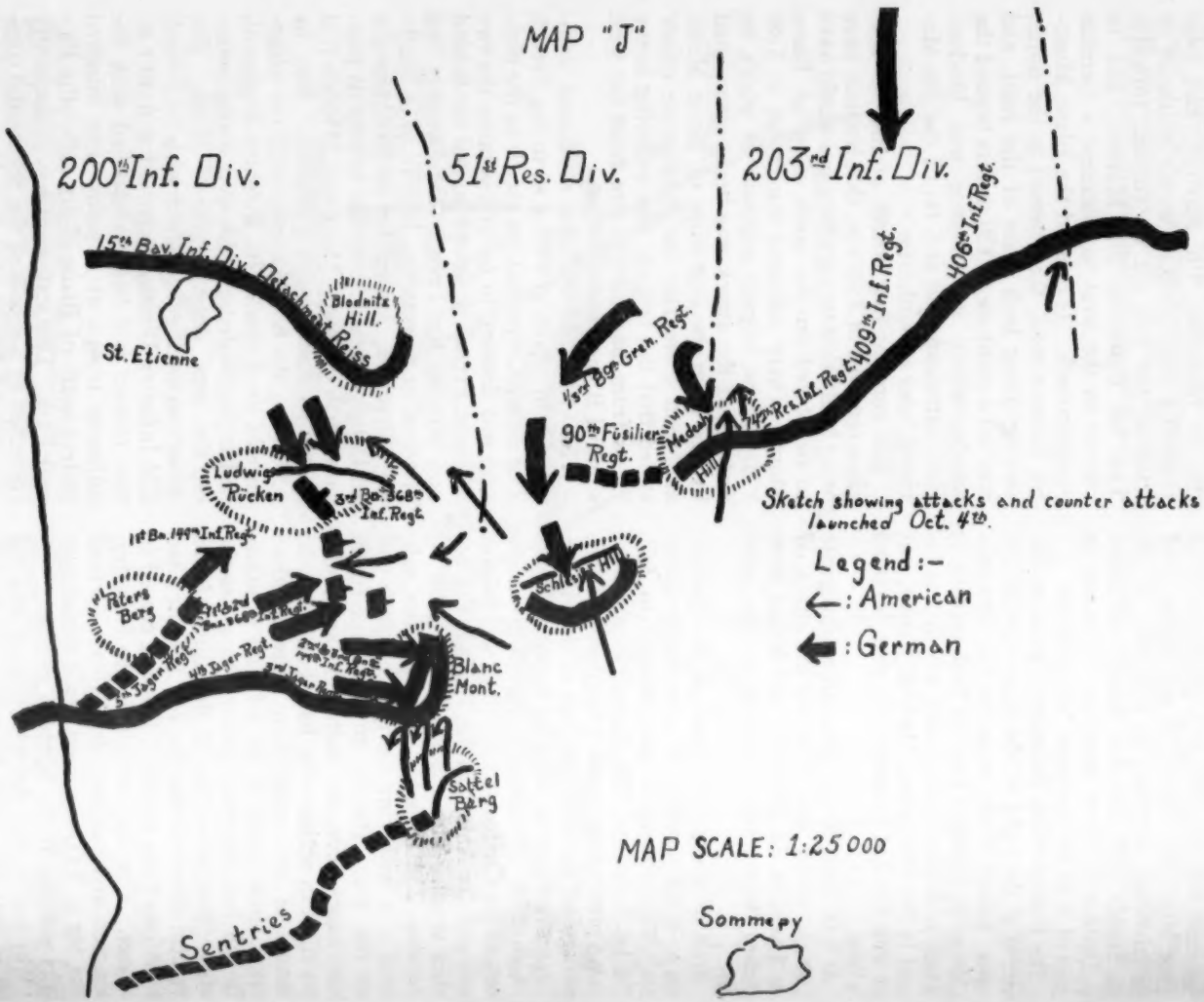
From its wedge-like position the division was to break through in a northerly direction. This operation was doomed to fail. The 1st Battalion, 23d Infantry, advanced from a protruding position southeast of Etienne against the hill northeast of the village. This proved to be an isolated thrust since the French 67th Division, engaged in action south of the Château of Bémont, was too far away and the American 4th Brigade did not attack at all. The attack waves of the 1st Battalion, 23d Infantry, were at once subjected to a withering German machine-gun and rifle fire. Having suffered extremely heavy losses—even the battalion commander was killed in action—the battalion, after an advance of not more than three hundred meters, drew back to its original position. The 9th Infantry was ordered to assist the attack. But when the 2d Battalion of this regiment observed that the 23d Infantry had discontinued the attack, it likewise ceased to advance. The 1st Battalion, 9th Infantry, advanced and reached the Etienne-Orfeuil road, but at 9:00 P.M. was again withdrawn to its position at the Médéah Ferme.

Why was it that the 4th Brigade was not put in action? The brigade commander, Brigadier General Neville, ordered at 3:00 P.M. that the 5th Marines, followed by the 6th Marines, was to carry out the attack. When they received their orders, the battalions of the 5th Marines were just in the act of advancing in the attack which, as we have seen, had been ordered to be launched by them in the evening of October 3. In its endeavor to comply with these earlier orders, the 3d Battalion, 5th Marines, had even reached a small strip of woods southeast of Etienne, but had got no further forward. The 1st Battalion, 5th Marines, had to swerve to the west to intercept a German counterattack. It crossed the Blanc Mont–St. Etienne road, then turned to the north, moving along both sides of the road, and reached a point about 150 meters beyond the woods, where its advance was blocked. Both battalions (3d and 1st of the 5th Marines) later on withdrew.

The commanding officer of the 5th Marines reported at 3:20 P.M. that his men were being badly shot up; artillery fire would have to be placed on the north slope of Blanc Mont. There followed the report at 3:40 P.M. of the brigade adjutant in which he stated that the attack was being intercepted by fire from the east slope of Blanc Mont, and soon thereafter the intelligence officer stated that the brigade was suffering heavy losses from machine-gun fire from the west slope of Blanc Mont.

This situation led the divisional commander to report at 4:00 P.M. to the French 21st Army Corps that the attack of the division was doomed to failure, because the two adjacent French divisions lagged far behind and because the French 22d Division had attacked in a westerly, instead of a northerly, direction. He further declared that the 2d Division would be unable to hold its position north of Blanc Mont and Médéah Hill unless its flanks were protected. But, by 6:00 P.M., the 6th Marines, with the assistance of the French 17th Infantry Regiment, had captured the machine-gun strong points on the west slope of Blanc Mont. The American intelligence officer with the French 22d Infantry Division reported at 6:40 P.M. that contact had been established with the adjacent troops at a point four hundred meters north of Blanc Mont, called the Pioneer Park. This statement was subsequently corrected by a report of the regimental commander, 6th Marines, to the effect that there still existed a gap of some 450 meters between his own sector and that of the French 22d Infantry Division.

We shall perceive from the German reports the great importance of these combats around Blanc Mont, in which the machine-

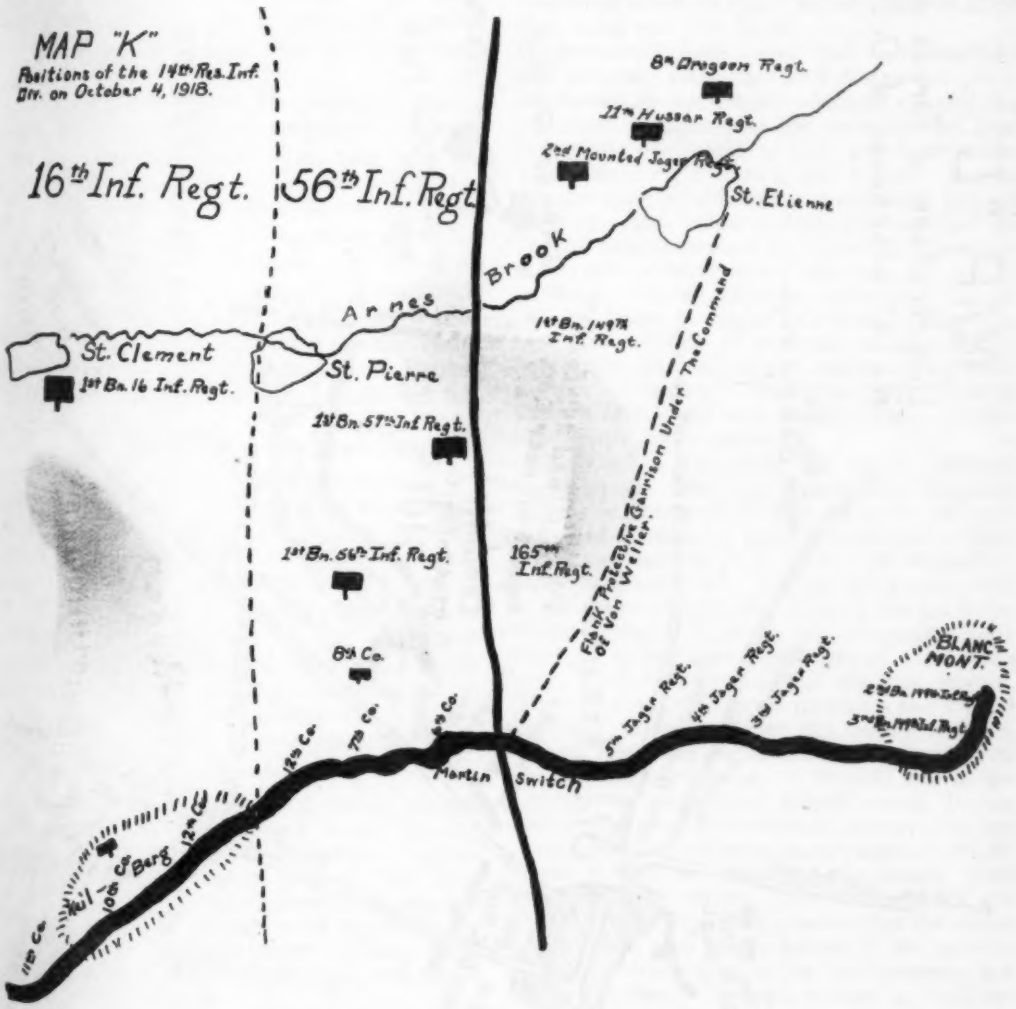

MAP "J"
200th Inf. Div.
51st Res. Div.
203rd Inf. Div.
15th Bav. Inf. Div. Detachment Reiss
Bladnitz Hill.
St. Etienne
Ludwigs Rücken
3rd Bn. 368th Inf. Regt.
1st Bn. 199th Inf. Regt.
Ritters Berg
3rd Jäger Regt.
4th Jäger Regt.
Blanc Mont.
Saltel Berg
Sentries
Schlesstadt Hill
90th Füsilier Regt.
4/5th Bav. Gren. Regt.
Medeah Hill
74th Res. Inf. Regt. & 409th Inf. Regt.
406th Inf. Regt.
Sketch showing attacks and counter attacks launched Oct. 4th.
Legend:-
←: American
←: German
MAP SCALE: 1:25 000
Sommepy

gun strong points were by no means the deciding factor.

As a result of a misunderstanding, the 2d and 3d Battalions, 9th Infantry Regiment, retreated at about 8:00 P.M. But they immediately advanced again into their former positions.

ule; on Helenen Hill, which was subjected to a severe artillery bombardment, there were, early in the morning, only sentries of the 200th Infantry Division.

At 8:40 P.M. Schlesier Hill was again in the hands of the Germans. With the combined attacks of the elements of the 149th



This in a measure explains the fact that, on October 4, the American 2d Division had repulsed all attacks against its flanks, but at midnight was still located generally in the same position it had occupied the day before.

Now how did the situation develop on the German side during October 4?

During the night, the withdrawal of the front of Group Langer and the right flank of Group Py had been carried out on sched-

and 369th Infantry Regiments, the 1st Bavarian Regiment and the 7th and 15th Bavarian Infantry Divisions, as well as the assault battalion which had arrived at about 4:00 P.M., the Germans had been able to force the enemy, who had advanced as far as Ludwigs Rücken, back in a southeasterly direction and to take up contact with the 200th Infantry Division on Blanc Mont. In front of the right flank and the center of

MAP "L"
Distribution of forces of Group "Reis" afternoon of Oct. 4, 1918.
Map Scale 1:25000
1 Co, 1st Bav. Inf. Regt.
Road to Bohnert Farm.
3/Bn. 90th Füs. Regt.
2nd Bn. 90th Füs. Regt.
1st Bn. 90th Füs. Regt
Divisional Boundary Line
Combined 21st & 25th Pio. Coys
Grenadiers Hill
Road to Semide
11th Hussar Regt.
St. Etienne
Blodnitz Hill.
72nd Inf. Regt.
Combined Co's of the 31st & 32nd Inf. Regts.
Road to Sommepy
21st Hussar Regt. Assault Bn.
Ludwigsrücken
Road to Blanc Mont.
Road to Machault.
1 Co, 32nd Bav. Inf. Regt.
Bn. 1st Bav. Inf. Regt
3rd Bav. Inf. Regt
Road to Cauroy
1 Co, 1st Bav. Inf. Regt
Army Boundary Line

this division, the enemy had forced our outpost sentries back as far as the Third Main Line of Resistance. From 9:00 A.M. on, an overwhelming artillery bombardment covered the area from Blanc Mont to a point beyond the left boundary of the group; this the enemy followed up with thrusts that were even stronger than those of preceding days and employed a number of divisions which had only recently come up from the rear.

After bitter combats, of frequently changing issue, the enemy succeeded in regaining possession of Schlesier Hill, and later on also of Médéah Hill. (See Map J.) On the other hand, the 200th Infantry Division, fighting with incomparable valor, and the 3d Guard Infantry Division warded off all attacks on a front that extended from Steinberg as far as the eastern boundary of the Group, and immediately threw the enemy out of their lines wherever he entered. During these mass attacks the enemy suffered tremendous losses.

From the vicinity of Schlesier Hill, the enemy employed strong detachments in attack against the Blanc Mont-Ludwigs Rücken line and Blodnitz Hill. This was the attack of the American 2d Division. I will therefore quote exactly the combat reports of the 31st Bavarian Infantry Regiment of Group Reiss (consisting of the aforementioned Regiment, the 32d Prussian Assault Battalion, and the combined 24th and 25th Bavarian Pioneer Companies) which give a very vivid picture of what happened around Blodnitz Hill (See Map L):

In the evening of October 3, strong American detachments had forced weak German troops, constantly threatened with envelopment, to evacuate Ludwigs Rücken. The forenoon of October 4, was destined to see the Germans again in possession of this very important point. For this purpose, Group Reiss had planned a counterattack which was to be launched at 4:15 A.M.

In a magnificent forward rush, though suffering considerable casualties, the assault battalions soon recaptured the hill line. However, as reënforcements failed to arrive and strengthen both flanks, it was impossible to maintain this hill against an American counterattack that was launched from a depression south of Ludwigs Rücken. A new attempt to regain the hill was planned by the commanding officer, to be launched at 9:40 A.M. This assault coincided and collided with an American attack against the St. Etienne–Blodnitz Hill line.

As Ludwigs Rücken was wooded only in places, and the cover consisted of low shrubbery, undergrowth, and young trees well separated by clearings of varying width, the different phases of the attack could be followed closely and the most effective counter measures taken. It was to our advantage that the Americans launched their attacks chiefly from the north slope, in other words, the hill slope that faced our own lines.

Undoubtedly, the attack had been carefully and minutely planned. At a designated point, all American assault detachments crossed the hill crest, withdrew to the west into an area apparently designated as their attack objective (later their right flank), and halted. In this manner they established a continuous line of riflemen, close behind which fell in other independent detachments, as reserves. The movements into combat zones were carried out by extremely varied methods: now in lines of riflemen, now in single and double files, then again in columns of platoons or squads, but sometimes also in platoon columns and loose groups. It was no difficult matter to estimate that the attack had been carried out by a battalion of full combat strength.

Even when deploying, the enemy suffered bloody losses. The separate and isolated groups coming in carelessly at first, were at once subjected to a withering concentrated fire of light and heavy machine guns. Everywhere good results were observed. Gaping holes were torn in the lines of riflemen, entire columns being mowed down. Much to our advantage were the light yellow-brown uniforms of the Americans, altogether impractical for this terrain. They were visible at great distances and offered excellent targets. After the enemy had deployed along the entire front, he prepared to descend the north slope of the hill and to debouch from the elevated strip of woods. In this attempt he was everywhere unsuccessful because our machine guns placed such a well-directed fire on the slope that the enemy, after long-continued efforts, finally abandoned his plans. One could plainly observe that the unrest in his ranks grew every minute. Lone individuals, and frequently entire detachments, ran aimlessly about. A great number of dead remained on the field. Already, a few began to escape up the hill; finally the hostile detachments, in wild flight, hastened up the slope. Our own artillery now launched a well-directed fire on the strips of woods and completed the enemy's confusion. Even during their flight, they were sharply pursued by our machine-gun fire. From about 1:30 P.M. on, the north slope of Ludwigs Rücken was entirely free of enemy troops. His losses must have amounted to no less than 40 per cent.

From 2:00 P.M. on, the enemy again renewed

his attacks, employing, as usual, strong forces (estimated at no less than two battalions). The attack, which this time was directed chiefly against Blodnitz Hill, came as a complete surprise, striking our lines with considerable energy. This time, the enemy had wisely concentrated his forces *behind the hill crest* and the depression east of it. With from three to five attack waves (with from one to two paces interval between each) followed up by closed columns of upwards of platoon strength, he stormed down the hill. Soon our machine guns here, too, found their targets and began to cut down the attacking files, for in this open terrain they could find no suitable protection. Here the losses of the enemy must have been especially heavy. One column received a direct hit from an artillery shell. A line of riflemen of from thirty to forty men, deceived into using for cover a railway embankment that stretched along the front in a semicircle, found themselves facing the wrong front, and came under our enfilading fire. When darkness fell they were still lying motionless on this same spot, presumably dead.

These and other scenes rolled before our eyes continually. It must be remarked that the enemy, despite his heavy losses, again and again resumed his attacks. Not until the gaps between his lines had become larger and larger did the attacks come to a standstill. Only on his right flank was he able to approach our lines to a distance of from forty to fifty meters, but was soon forced to withdraw. The situation became critical when there arose on our own side a shortage of ammunition. To this was added a lack of oil and water for the machine guns. Instead of oil, our men were forced to use butter. The munition shortage was eased up by designation of a regular carrier service that worked excellently.

Thus this attack was also shattered and, amidst the jubilance of the defenders, the Americans were forced to retreat for the second time this day, the last withdrawals taking place only at darkness. The bloody losses of the enemy, especially of killed, during the second attack, were heavier than in the forenoon and amounted to at least 60 per cent.

The attack was warded off without artillery assistance of any sort. Next to the excellently directed machine-gun fire, the rifle fire of the infantry deserved credit for the success.

It has been ascertained that, on this day, one single machine gun (personally manned and fired by Vice Sergeant Major Kohnle of the 31st Bavarian Infantry Regiment, 1st Machine-Gun Company) spent no less than 23,000 shots in well-directed fire upon the Americans.

During these combats, the activities of the 4th Company, 31st Infantry Regiment, under the command of First Lieutenant Bock, then located in a gravel pit, were especially noteworthy.

The commanding officer of the 23d Infantry Brigade remarked in regard to all these reports: "The troops have fought brilliantly and deserve unlimited praise."

The report of Major Reiss, 31st Bavarian Infantry Regiment, quoted at length above, tallies with other German daily reports regarding the combats of this day. There is, however, a certain inconsistency between his statement and the description I rendered at first, which was taken from the American Monograph 9, "Blanc Mont." In his report, mention is made only of the attack that was launched during the afternoon, while during the forenoon the Americans are said to have been on the defensive, warding off German assaults. It is hoped that helpful statements of American participants may clear up this contradiction.

At 12:00 o'clock noon, October 4, the regimental commander of the 74th Reserve Infantry Regiment, Major Streit, despatched the following carrier-pigeon report to the 203d Infantry Division, which received it at 2:00 P.M. (Headquarters being located in Juniville):

At 9:15 A.M. the enemy launched a severe artillery preparatory fire and at 10:00 A.M. attacked along both sides of Médéah Hill-Semide highway, employing strong forces. Separate penetrations in the sector of the 3d Battalion, 74th Reserve Infantry Regiment, north of Numeral 1352 "f"; front lines of the 1st Battalion, 74th Reserve Infantry Regiment, at northwest slope of Médéah Hill were avoided and elements of their troops reached the rear lines of the battalion as well as the battalion command station located in map Square 1251. The attack was warded off with heavy losses for the enemy. I have ordered the 2d Battalion, 89th Grenadier Regiment, together with the 1st and 3d Battalions, 74th Reserve Infantry Regiment, with one platoon of accompanying artillery, to launch a counterattack against Médéah Hill after an artillery preparation that will begin at 12:00 o'clock noon. *The enemy forces are mixed American and French troops.* The presence of the French 346th Infantry Regiment has been confirmed. It is desirable that the 24th Bavarian Infantry Regiment be placed in support behind the right flank.

At 2:10 P.M. Major Streit despatched another carrier-pigeon report that arrived at 2.50 P.M. It said that the 2d Battalion, 89th

Grenadier Regiment, was already employed at another part of the front, that its men were exhausted and were almost without ammunition. He stated that this had been his reason for requesting the 24th Bavarian Infantry Regiment to place itself in support behind the right flank with its troops echeloned.

During the attacks we have here described, the 89th Grenadier Regiment captured men of the American 9th Infantry Regiment.

At 12:00 o'clock noon the 75th Infantry Regiment placed itself in support in the vicinity of the Bémont Ferme and the Fourth Main Line of Resistance. Two battalions were placed at the disposal of the 51st Reserve Division; one battalion remained with the 203d Infantry Division.

Group Py decided now to pinch off the American 2d Division in its wedge-like position. It therefore ordered at 2:00 P.M. a combined counterattack of the 51st Reserve Division, reënforced by elements of the 17th Infantry Division, in the general direction of Schlesier Hill. (See Map J).

At 2.15 P.M. the 51st Reserve Division forwarded the following order to the 102d Infantry Brigade:

Schlesier Hill must be in our possession by tonight. The 200th Infantry Division will attack from the direction of Petersberg with two battalions. We will place at your disposal one battalion of the 75th Infantry Regiment now located in Albrechts-Mulde. Echelon this battalion behind the right flank. The other battalion of this regiment will remain Army reserve and will be moved into the vicinity of the Fourth Main Line of Resistance southwest of the Bémont Ferme.

The operations officer of the 203d Infantry Division telephoned at 3:30 P.M. to the operations officer of the 51st Reserve Division as follows: "You can depend on it that our right flank will not lag behind."

The attack orders, however, did not get pushed through soon enough and in addition to that the enemy themselves, as we have seen, had also taken up the offensive. Thereby, after fierce fighting east of the highway that leads to Médéah Hill, they gradually won ground until they reached the narrow road that leads from Steinberg to Blodnitz Hill. To oppose this move, the 203d Infantry Division employed the 89th Grenadier Regiment and elements of the 24th Bavarian Infantry Regiment. At 5:00 the enemy again assaulted our troops on Steinberg. Twice the counterattack of the 409th Infantry Regiment threw him back. By the third attempt he succeeded in pushing the regiment back as far as the north slope of Steinberg.

Among these accounts, the events that took place in the vicinity of Blanc Mont are of special interest to us.

(See Map N). We have learned from descriptions of previous days that the 149th Infantry Regiment, located at Blanc Mont, had been promised assistance in the form of two battalions of the 368th Infantry Regiment, which, however, could not at first be found. At 1:00 A.M. October 4, the 200th Infantry Division issued an order to the Jäger Brigade:

Two battalions of the 368th Infantry Regiment with accompanying batteries are moving backward from Helenen Hill into the vicinity north of St. Etienne; they will be placed under the command of the Jäger Brigade and moved to Petersberg. At 6:00 A.M. the battalions will form for an attack against Ludwigs Rücken from a southwesterly direction. After the capture of that hill, the battalions will swerve to the southeast and advance with their right flank in the direction of Blanc Mont, with their left flank upon Schlesier Hill; at the right they will have contact with the 149th, at the left with the 90th Füsilier Regiment. The latter will attack Schlesier Hill. The assault will be prepared with artillery fire, which at 6:00 A.M. will be placed in front of Blanc Mont as a box barrage.

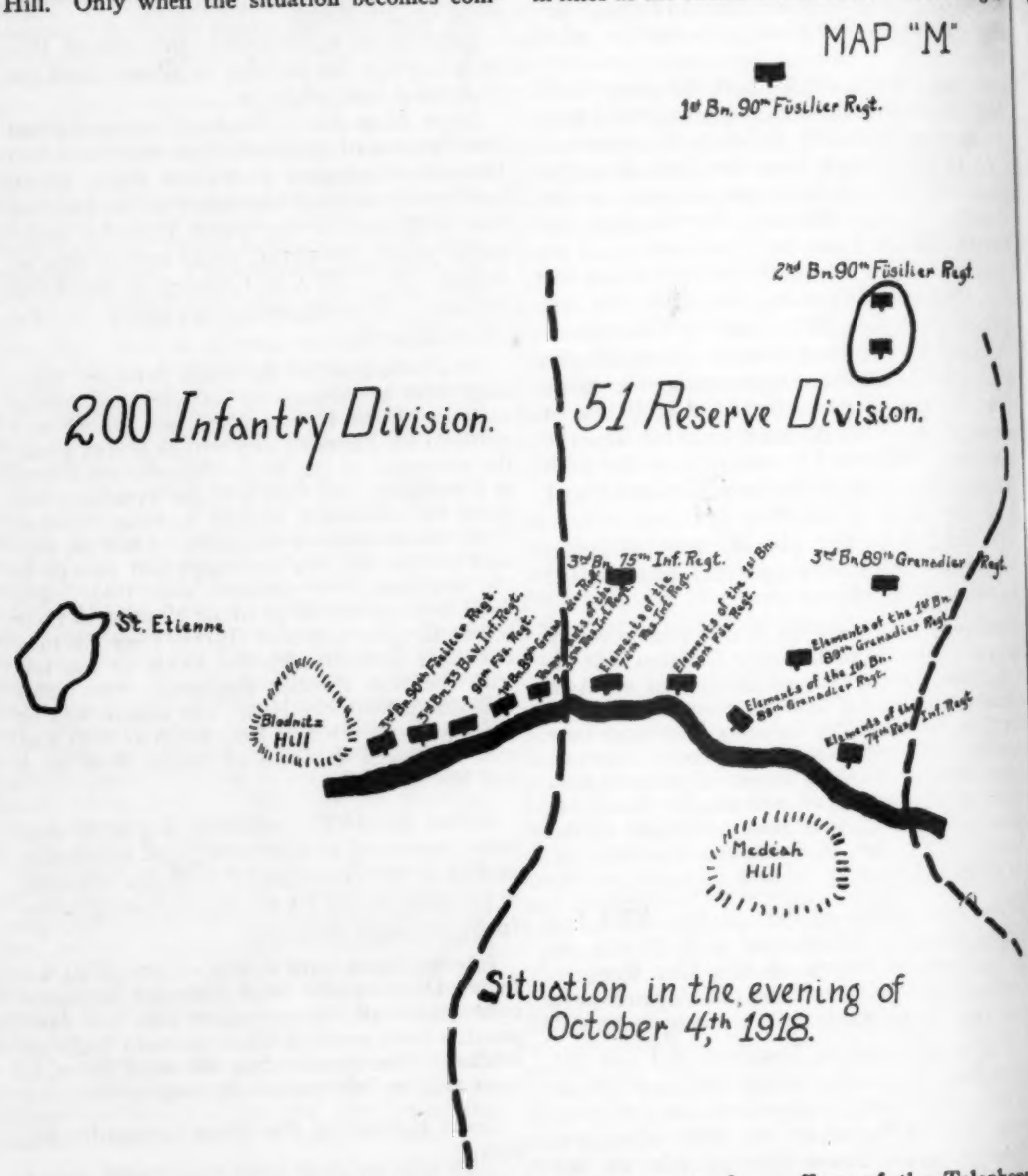
After the 149th Infantry Regiment had been instructed to take charge of reconnaissances in the direction of Ludwigs Rücken, it received at 3:15 A.M. the following order from the Jäger Brigade:

In compliance with orders of the 200th Infantry Division, the 149th Infantry Regiment must under all circumstances hold the flank position from south of Blanc Mont to Ludwigs Rücken. The commanding officer of the regiment will be held personally responsible.

Soon thereafter the Jäger Brigade ordered:

All possible attempts will be made to find the two battalions of the 368th Infantry Regiment; Major Wild, as was previously stated, will order them to attack. The 14th Reserve Division has promised us to place these two battalions in support not later than 4:00 A.M. If the battalions are not found, the 149th Infantry Regiment will nevertheless hold its own on Blanc

Mont *as long as is humanly possible* and await the result of the attacks of the 15th Bavarian Infantry Division advancing next morning from Etienne against Ludwigs Rücken, and of the 90th Füsilier Regiment against Schlesier Hill. Only when the situation becomes completely untenable, and the expected pressure in the morning from the north fails to materialize, can there be any question of withdrawal into the Petersberg—east edge of St. Etienne line. This withdrawal, if necessary, will be step-by-step, fighting for every foot of ground. Beginning on the left flank it will be carried out by all three regiments. It case the two battalions, 368th Infantry Regiment, make their appearance in the vicinity north of St. Etienne not earlier than the morning of October 4, which is entirely within range of possibilities, they will be immediately concentrated there and employed in lines as the situation demands. According to the statement of an officer of the Telephone Detachment, it appears that last night the portion of Ludwigs Rücken located east of the St. Etienne–Blanc Mont highway was free of the enemy. Consequently, it is possible that the enemy felt too uncomfortable in the sharply pointed wedge which he had driven into our front, and voluntarily evacuated it.


MAP "M"
1st Bn. 90th Füsilier Regt.
2nd Bn. 90th Füsilier Regt.
200 Infantry Division.
51 Reserve Division.
3rd Bn. 75th Inf. Regt.
3rd Bn. 89th Grenadier Regt.
St. Etienne
Elements of the 1st Bn. 89th Grenadier Regt.
Elements of the 1st Bn. 89th Grenadier Regt.
Bladnitz Hill
Medeah Hill
Situation in the evening of October 4th 1918.

MAP "N"
Situation in Sector of
149th Inf. Regt. at
12:00 noon Oct. 4, 1918.
St. Etienne
Blodnitz Hill.
enemy advance
1st Bn. 149th Inf. Regt.
Ludwigs
3rd Bn. 368th Inf. Regt.
Rütken.
enemy advance
Peters Berg
Machine Guns
2nd Bn. 149th Inf. Regt.
Blanc Mont
3rd Bn. 149th Inf. Regt.
Sattel Berg

The 149th Infantry Regiment had submitted a request that at least its 1st Battalion be placed at its disposal. In reply to this, it was advised at 6:10 A.M. as follows:

The 149th Infantry Regiment cannot expect to have returned to its command its 1st Battalion, which, for special missions, has been temporarily placed at the disposal of the 165th Infantry Regiment. Moreover, the 149th Infantry Regiment is herewith expressly ordered to hold the lines with its present forces, in order to protect the flank of the 200th Infantry Division. For this the commanding officer will be held responsible. In line east of St. Etienne —east of Petersberg is a reserve force composed of elements of the 1st Army.

However, this order was amended at 9:35 A.M.:

The 1st Battalion 149th, will be placed at the disposal of the regiment. It will be immediately ordered to attack Schwabenkönig via Ludwigs Rücken—Grenadier Hill. Schlesier Hill has been captured by the 90th Füsilier Regiment. The 149th Infantry Regiment will immediately, with all its available forces, advance into the Blanc Mont–Schlesier Hill line. The 3d Battalion, 368th Infantry Regiment, is likewise at the disposal of the regiment. Major Wild will temporarily place the two other battalions in the Blanc Mont–Schlesier Hill line, leaving them first at the north slope of Blanc Mont. While there, they will be designated Brigade Reserve.

From his command post at the road fork northwest of Blanc Mont, the regimental commander, 149th, at 12:00 noon, despatched a report and situation map (See Map N):

Local situation looks very critical to me; an envelopment by the enemy advancing from the valley of the Arnes brook is not unlikely. Am under the impression that I should not retreat without orders. Please give me instructions.

Signed: GRUNDEL

After false preliminary reports regarding the two battalions of the 368th Infantry Regiment, the 14th Infantry Division at 10:28 A.M. stated that it had issued orders to the 368th Infantry Regiment to remain in Pregel Camp and there to await further orders of the 213th Infantry Division. It was further explained that the 14th Infantry Division was unaware of any orders from the 200th Infantry Division that the 368th Infantry Regiment should return to Petersberg. Thereupon the regimental commander, 368th Infantry, was ordered at 11:05 A.M. to move from Pregel Camp northwest of St. Etienne to Petersberg, with instructions that it was to be placed under the command of the 2d Jäger Brigade. Furthermore, it was ordered to move up the 3d Battalion, 368th Infantry Regiment, which was then in the act of marching in the direction of Ludwigs Rücken, and employ it in the sector of the regiment that lay between Blanc Mont and Schlesier Hill.

To the operations officer of Group Py, the operations officer of the 200th Infantry Division reported at 12:47 P.M. as follows:

At the front, no change. Enemy pressing our outposts. The 15th Bavarian Infantry Division and the 1st Battalion, 149th Infantry Regiment, have captured Ludwigs Rücken; 1st Battalion of the latter regiment has suffered heavy losses. Possible that the 368th Infantry Regiment will arrive on Petersberg around 2:00 P.M. The division requests to be relieved.

For a long time, the reports received by the divisions concerning the situation on Ludwigs Rücken gave no clear picture. This explains the fact that our artillery launched its fire on the Americans located there only after considerable delay.

The 2d Jäger Brigade received at 2:45 P.M. the following report, despatched at 11:45 A.M., from the 149th Infantry Regiment:

Since 8:45 A.M. I have been without communication with the brigade. Telephone connection was impossible by any means. I can now sum up the events of the day: Since dawn repeated attempts of the enemy against my left (northern) flank, frontal attacks from the east, and enveloping attacks from the depression in map Squares 1448 and 1348, all repulsed by our rifle and machine-gun fire. Since 8:45 also, *our own* artillery, sometimes for hours at a time, has maintained a fire on this very same northern flank, firing from the direction of St. Pierre; we were also gassed. Losses suffered from our own fire, which fell short and could not be stopped by yellow signal flares, are considerable. The 3d Battalion, 368th Infantry Regiment, arrived here at about 9:00 A.M. and has been employed on Ludwigs Hill at a point approximately five hundred meters east of the St. Etienne–Blanc Mont highway in order to ease the situation of my northern flank which is located in map Square 1448. This battalion arrived here just at a time when we were under a very severe and devastating *fire of our own artillery* from the north and northwest.

From 10:00 A.M. on, repeated attacks against Blanc Mont, launched from the direction of Sattelberg, have been repulsed by my troops. On all these occasions, our own batteries were a flat failure.

Since 8:00 A.M. we have repeatedly observed that strong hostile detachments, moving along the St. Etienne–Schwabenkönig road, are crossing Ludwigs Rücken in the direction of St. Etienne. The enemy is now attacking my left flank in map Square 1448 from the direction of Grenadier Hill.

As yet, I still hold my own in this line. But if our own artillery does not immediately assist us, instead of inflicting casualties in our ranks, as heretofore, I will not be able to guarantee a prolonged resistance of my troops, already badly depleted by their own artillery.

How is the general situation?

Signed: GRUNDEL

Other troops also complained of having suffered severely from our own artillery, which, no doubt, in the peculiar combat situation then prevailing, must have found it difficult to correctly direct its fire.

The 1st and 2d Battalions, 368th Infantry Regiment, under Lieutenant Colonel Mannkopf, reached Petersberg at about 3:00 P.M. (See Map J). They were at once directed to launch a counterattack to the north against Grenadier Hill in order to fill the gap between the sectors of the 149th, at the right, and the 3d Battalion, 368th Infantry Regiment, at the left, and by an energetic thrust cut off the American troops located on Ludwigs Rücken from their main body of troops. Their attack, which at first went ahead with comparative ease, came to a standstill at the St. Etienne-Schlesier Hill highway just as darkness fell. The Americans were pushed back, but it was not possible to close the gap, several kilometers wide, between the 149th and 368th Infantry Regiments.

At this point the following fact must be inserted: As early as October 3, the Group of Armies, German Crown Prince, had issued the following order:

During the night of October 4 to 5, the main resistance of the 1st Army will be shifted behind the Suippe. Contact with the 3d Army will be established just as the situation demands: either in the Third Main Line Resistance, in the direction of Blanc Mont, or in the Fourth Main Line Resistance behind the Arnes sector. Final orders regarding execution of this order will be issued by 9:30 A.M., October 4.

On October 3, Army Headquarters of the 3d Army had amended its former retreat order (Gudrun Operation) to read as follows:

A systematic withdrawal into the Brunhild position is a question that concerns at present only Groups Py, Perthes, and the right flank of Group Aisnes. From Vaux le Mouron eastward, the lines heretofore ordered established in and around both sides of the Argonne forest will be held as permanent positions. These retreats into the Brunhild position will *not* be preceded by a certain fixed preparatory period; on the contrary, it may be expected with reasonable assurance that *the execution of such orders may be designated to take place immediately after issuance thereof.* Destruction of position, constructions, etc., useful to the enemy will be limited to a minimum. Devastation of the country is prohibited.

Between 3:00 and 3:30 P.M., October 4, 3d Army Headquarters ordered that, during the night of October 4 to 5, the divisions were to retreat into the Fourth Main Line of Resistance, then called the Arnes position. As early as 3:25 P.M., the chief of staff of Group Py had informed the 200th Infantry Division:

Tonight you will withdraw into the Fourth Main Line of Resistance. This movement shall not in any way influence your attack of today. The 213th Infantry Division will then be inserted in lines at the left flank of the 200th Infantry Division.

Further instructions were issued at 5:50 P.M. by Group Py:

Tonight at 10:00 o'clock the troops now in rear of your sector will begin their retreat; at 12:00 o'clock midnight, your line battalions will retreat. The 200th Infantry Division will take over the sector, occupying the right with its own troops, and the left with those of other units. Tomorrow noon, the 213th Infantry Division will take over this left sector; the 1st and 15th Bavarian Infantry Divisions will be relieved. Southernmost line held occupied by the artillery: Taubenhöhe–Cauroy—north edge of Hohenzollern Hill.

Acting at once upon these new instructions, the 200th Infantry Division immediately ordered the distribution of the regiments within the new sector, from right to left, as follows: 5th, 4th, 3d Jäger Regiments, 149th and 368th Infantry Regiments.

At the same time that all these preparations for the voluntary retreat from the old German positions were going on, fate sealed

the doom of the unfortunate 149th Infantry Regiment on Blanc Mont. Of this event, the regimental commander, Major Gründel, gives the following account (See Map N):

When, despite the attack of the Bavarians, the enemy continued to expand further and further westward on Ludwigs Rücken, I was advised during the forenoon of October 4, that the 3d Battalion, 368th Infantry Regiment, would be placed at my disposal. The results of the valiant but vain efforts of this battalion are revealed by its report issued at 4:15 P.M., October 4:

"At about 12:00 o'clock noon, the battalion was attacked by strong infantry masses. Enemy entered the outpost positions of the battalion. It was forced to shift its front line on Ludwigs Rücken to the west side of the St. Etienne–Blanc Mont highway. At my left were located Bavarians who had retreated. As a result of the hostile attack I lost touch with one and one-half companies. The losses of the battalion are considerable. Companies are now being transformed into new units as far as is possible under the heavy bombardment. If I withdraw a single company, it will be impossible to prevent the enemy from taking possession of Ludwigs Rücken. In view of the local situation, I consider the withdrawal of one company at present entirely out of the question."

With its seriously depleted companies, the 149th Infantry Regiment for the past thirty-six hours has been holding its own in a position 1500 meters long, on which was focused the chief pressure of all hostile attacks. Notwithstanding this, the thought of yielding to the heavy pressure of the enemy on all sides seemed to enter no one's mind. Reënforced by the 10th Company, the 2d Battalion, 149th Infantry Regiment, held an almost impregnable position in Blanc Mont. The 11th and 12th Companies in their contact positions south thereof had, it is true, during the afternoon yielded a certain extent to renewed hostile attacks. It happened to these companies, on top of their other troubles, that their rolling kitchens had failed to come forward the day before, and the pangs of hunger were felt by all. Into this position the enemy had hammered a dent, but he dared not push through.

At the outset of the fighting I shifted my command post to the road fork immediately northwest of Blanc Mont. I saw no reason, on October 3, to shift it farther to the rear, especially since I would lose thereby my present excellent view of the entire situation. After the bowing in of the lines of the 3d Battalion, however, I saw that I would soon be forced to withdraw my command post to a better protected location. Still I thought best to postpone removal for fear of the effect on the hard-pressed troops, and remained at a point now practically in the foremost line. In the events which quickly followed, the unfavorableness of this location for a command post soon became evident.

As late as 5:00 P.M. I had been on the observation post of Blanc Mont and had seen that on almost all sides the enemy was quite strong, but seemed nowhere inclined to resume his attacks. I found officers and enlisted men of the 2d Battalion maintaining usual coolness and composure. In fact, it seemed to me to be simply another of those situations where, as between the opposing troops, the stronger nerves would decide. My concern as to whether the troops would be able to stick it out through the following night I had made known earlier in the day, sending the report to Headquarters, 200th Infantry Division, for lack of other means of communication, by my last carrier pigeon. I had provided an orderly retreat in the event of an emergency, the focal point of subsequent concentration being St. Etienne and St. Petersberg. This plan I had very carefully worked out, but for good reasons had given no orders revealing it. Thus on the evening of October 4 the troops knew only that they were to hang on, and that military honor pledged them to defense of their position till they had fired away their last round. I felt that I was not authorized, nor as yet sufficiently hard pressed, to order the withdrawal of my troops, imperiled though they were, from positions that seemed to me of especial importance.

Of course, after its last withdrawal into the densely wooded terrain in which observation possibilities were reduced almost to nil, I found that I was unable personally to control the 3d Battalion, 149th, and there was also a question whether it was still held firmly in the hands of its officers. However that might be, just as darkness fell around 6:30 P.M., the battalion commander, 3d Battalion, 149th Infantry, suddenly appeared alone at my command post and reported that his battalion had just yielded before the pressure of a surprise attack, and that the enemy was in sharp pursuit. Almost at once this was confirmed by an uproar of foreign voices and rifle shots, all very close at hand. An attempt to get in touch with the command post of the 2d Battalion, 149th Infantry, by telephone, failed as there was no response. So a messenger with news of the situation was hurriedly despatched to Blanc Mont. It could not be confirmed whether this man got through. For the regimental staff, however, it was now high time to fight its way to the rear through the ranks of the sharply pressing enemy. With the aid of our weapons, we succeeded in fighting our way as far as the command post of the 4th Jäger Regiment. Halting here, I repeatedly attempted to obtain com-

munication with my troops on Blanc Mont by way of the communication system of this regiment. But all attempts were in vain. In view of the foregoing, it is likely that the 2d Battalion, 149th Infantry Regiment, never received my information regarding the situation so suddenly changed for the worse. The fact that during the night of October 4 to 5, even as late as 3:30 A.M., separate stragglers of various companies, as well as the bulk of the 10th Company, fought and cut their way to the rear as far as our own command post, shows that the majority of the front-line troops maintained their composure to the last minute. Of the elements that were located on Blanc Mont (10th Company and 2d Battalion, 149th Infantry Regiment), the following officers and enlisted men succeeded in getting to the rear: Lieutenant Fink of the 3d Machine-Gun Company, with 7 heavy machine guns; Lieutenant Brohn of the 10th Company with 36 men and 3 light machine guns; 102 officers and men of the 2d Battalion, 149th, with 4 heavy and 4 light machine guns.

Not more than 150 men probably fell into the hands of the enemy, as up to 4:00 P.M., the 2d Battalion, 149th Infantry, had submitted regular reports in which the casualities suffered on October 3 and 4, on Blanc Mont, were stated as amounting to 63 officers and men, exclusive of such losses as were suffered during the approach march to Blanc Mont as a result of hostile artillery fire.

To the above report, the commanding officer of the 37th Reserve Infantry Brigade, Colonel von Götze, added this:

To the sincere words of appreciation for the achievements of the regiment and its officers, already pronounced by the Higher Command, I can only add that the above described episode of the struggle will for all time remain a page of glory in the history of the 149th Regiment.

As in the previously narrated case the local combats around Blanc Mont arouse especial interest, it will perhaps serve our purpose well to insert the somewhat contradictory account which the 213th Infantry Division, of which the 149th Infantry Regiment was originally a member, submitted on the evening of October 4 to Group Py:

With its 1st and 3d Battalions, the 149th Infantry Regiment has reached the Fourth Main Line of Resistance and has occupied it, the 1st Battalion, 149th, with a strength of three, the 3d Battalion, 149th, with a strength of one company. Investigations are under way regarding the fate of the 2d Battalion, 149th Infantry. The following is reported to us concerning the engagements of the 149th around Blanc Mont: On the morning of October 3, the regiment by a clever counterattack recaptured Blanc Mont, which previously had been lost to the enemy after a surprise attack and evacuated by our troops. The regiment retook the hill immediately after its arrival, and held it until the evening of October 4, victoriously warding off all hostile attacks despite the fact that the enemy, after the capture of Ludwigs Hill, was directly in its rear and that the regiment, throughout the entire period, suffered considerably under the effect of the fire of its own batteries. On October 4, the 2d Battalion of this regiment, facing an eastern front, repulsed six strong hostile attacks; and the 3d Battalion, facing a southern front, victoriously warded off five major attacks. Toward 7:00 P.M. the enemy again launched an attack against the regiment from southerly, easterly, and northerly directions. He thereby succeeded in entering the sector of the 3d Battalion, 149th, which had been seriously depleted as a result of previous heavy losses, from the south, and it appears that he attacked the 2d Battalion, 149th, which held a front facing east, from the rear. Despite this difficult situation, with the regiment enveloped from three sides, the regimental commander succeeded in leading back to the designated positions the remnants of the regiment that were still able to carry a rifle. As many times before, this regiment on October 3 and 4 again brilliantly upheld its reputation as a fighting unit. Almost encircled, it held recaptured positions against furious blows of the enemy and by its perseverence prevented the enemy from rolling up our entire front to the west after he had attained a local success by penetrating our lines in the northeast. A major share in these honors must be accredited to the distinguished leadership of its regimental commander, Major Gründel, who has constantly held front-line command. In acknowledgment of the distinguished heroism of the regiment and its trusted leader in the Blanc Mont engagement, the 213th Infantry Division requests that an endeavor be made to secure for Major Gründel the award of the Order of Merit. The 200th Infantry Division, under whose command this regiment has been until this noon, has suggested that the proper steps be taken in this direction.

On October 5, the commanding general of the 2d Army wired:

To the commanding officer of the 149th Infantry Regiment I herewith express my special appreciation of the excellent spirit of his regiment, which was proved anew in the valiant perseverance of the 2d Battalion on Blanc Mont, surrounded by the enemy on all sides.

Signed: VON EINEM

The following was issued on October 6, 1918, by the commanding general of the 200th Infantry Division, General von Below:

During the bitter combats of October 4, the 368th and 149th Infantry Regiments have fought with great distinction. The difficult task of securing the left flank of the 200th Infantry Division in the face of a far superior enemy richly provided with all requirements of warfare, has been achieved by the two regiments after a series of brilliantly directed, daringly executed counterattacks. The recapture of Blanc Mont by the 149th Infantry Regiment, and its complete maintenance against subsequent superior attacks will forever form a page of glory in the history of the regiment. Thanks to the morale of the men in both regiments, far beyond all mere words of praise, and in most loyal coöperation with their brothers-in-arms, the Jäger Regiments, it was possible to retain the position assigned to them by the Higher Command. I beg to express to the two regiments my warmest thanks and fullest appreciation for their incomparable achievements.

In its orders concerning the occupation of the new positions by the Jäger Brigade, the 200th Infantry Division at 7:00 P.M. added the following instructions: "Within the sectors of the 5th and 4th Jäger Regiments decisive combats will be waged in an effort to maintain the possession of Arnes brook." Group Reiss (the 31st Bavarian Infantry Regiment of the 15th Bavarian Infantry Division) was now placed under the command of the 200th Infantry Division. At 9:15 P.M. a new order of the group was received regarding the withdrawal of the troops into the Fourth Main Line of Resistance, according to which it was permitted to begin its withdrawal as early as 8:30 P.M. When, however, at 10:45 P.M. the operations officer of Group Py declared that the 200th Infantry Division would be required to transfer the command of the 2d Battalion, 234th Infantry Regiment, to another division, the operations officer of the 200th Infantry Division replied: "We shall soon have no more men available. The 5th Jäger Regiment is now composed of a total of 80 men, the other regiments have quite as few. As I have done on previous occasions, I will again call attention to the fact that it is a question whether our troops will be able to maintain their positions." Soon thereafter the 51st Reserve Division forwarded a report to the effect that the Americans had occupied Ludwigs Rücken.

The positions which the German troops occupied during the night in compliance with orders of Army Headquarters are shown on Map O.

The Fifth Day of October

(See Maps O and P)

On October 5, the American 2d Field Artillery Brigade subjected the knoll and the east slope of Blanc Mont to an energetic fire. Then, at 7:15 A.M., the 3d Battalion, 6th Marine Regiment, attacked the German machine-gun strong points it still suspected of being located at these points. This battalion encountered no resistance whatever, and suffered no casualties. The remnants of the defenders, cut off from their main bodies since 6:00 P.M., may have sought shelter in the deep dugouts as soon as the hostile artillery bombardment began and there waited until they were taken prisoners. For these men there was really no other course. Two hundred and nine prisoners, seventy-five machine guns and trench mortars, and much valuable material, loose and utilized in construction of positions, fell here into the hands of the enemy.

From the report of Major Gründel of the 149th, we know that a great many of his men had been wounded by our own artillery fire. It was impossible, by day, to lead these men to safety from the somewhat protruding sector of this regiment. In the evening it was too late as the remnants of the regiment were already surrounded. This proves that a great number of the prisoners must have been wounded. Experience has shown also, especially during major combats, that many machine guns captured have been rendered useless.

That the 149th Infantry Regiment stuck in its critical situation as long as it did is amazing, and this fact justifies the statement of the commanding general of the 200th Infantry Division: "The 149th Infantry Regiment has accomplished a glorious feat."

Major General Lejeune, the commanding general of the American 2d Division, ordered at 5:00 A.M. a continuation of the attack in the direction of Machault-Cauroy, and stated that the exact hour of launching the attack would be made known later. As a matter of fact, zero hour was never actually ordered but instead the brigades were instructed to keep abreast of the advance of the other di-

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EFFECT OF AN AERIAL BOMB (VERY UNUSUAL PHOTOGRAPH)

These aërial bombs, especially the ones thrown off in series, so-called "chain bombs," caused the advancing German reserves great losses.

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A GERMAN HEAVY MORTAR IS BEING BROUGHT INTO POSITION
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GERMAN FIELD ARTILLERY CROSSING A FIRE TRENCH
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SALLY OF A GERMAN ASSAULT DETACHMENT
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GERMAN RESERVES ADVANCING TO BATTLE
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visions. At 6:00 A.M., the right neighbor, the French 73d Infantry Division, launched an attack, reached Wallmüller Camp at 7:10 A.M., but was promptly forced back into its own line of departure. Then the French employed here the 170th Infantry Division, which likewise made a futile attempt. General Naulin, the commanding general of the French 21st Army Corps, at about 1:40 A.M., October 6, informed General Lejeune that the French 73d Infantry Division would be assisted by another French division, but requested him to hold his 2d Division ready to have its reserves likewise advance in this direction.

This explains why, in the evening of October 5, the right flank of the American 3d Brigade was still located in the vicinity of Médéah Hill, which it had captured on October 3.

When the left neighbor, the French 22d Division, formed for the attack at 7:00 A.M., it encountered no resistance whatever, for the Germans had evacuated the terrain as far back as the Arnes brook. At 11:55 A.M. this division reached Pierre-à-Arnes and at once expanded its right flank in the direction of St. Etienne to a distance of one kilometer. At 2:45 P.M. contact was established between the two divisions at a point five hundred meters south of St. Etienne; it had taken the left neighbor until this hour to move abreast of the American 2d Division.

During the afternoon the 4th Brigade, at that time still somewhat in rear of the general line, made an advance in the course of which the 6th Marine Regiment, then in the second line, pushed through the lines of the 5th Marine Regiment, with its 2d Battalion leading. When the marines arrived at a point two kilometers south of St. Etienne, they were met with machine-gun fire. They at once threw themselves to the ground and entrenched. The 23d Infantry Regiment had not advanced; its left flank was now protected. To the 3d Brigade, of which the 23d Infantry was a member, was given the 4th Machine-Gun Battalion.

At 4:40 P.M. the American 2d Division received a report to the effect that St. Etienne had been captured by the French. But this report proved to be erroneous. The American 2d Division did not fall in with the suggestion of the French 118th Infantry Regiment, which had encountered no resistance whatever on its own front, when at 5:55 P.M. it asked that the Americans cooperate in a general advance upon St. Etienne. The 2d Division believed that its decision was justified in view of the energetic resistance which the Germans still offered here until finally, on October 8, St. Etienne definitely fell into the hands of the Allies. Just how conditions actually were at St. Etienne, we shall see.

Now we will review the measures that were taken on the German side. The commander in chief of the 3d Army, General-Oberst von Einem, on October 5, forwarded to the Group of Armies, German Crown Prince, the following estimate of the situation:

> While no doubt the enemy visualizes the wrecking of his great plan of penetration against our tenacious resistance, he has not yet ceased to hammer the fronts west of the Aisne and east of Argonne with continuous attacks. On the Argonne front a pause has occurred which may well be due to the restricted operative movements of the Americans. He attempts now—after his efforts at penetrating our lines have failed—to shatter our front by constant blows without regard to his own losses. An unlimited continuation of attacks must be reckoned with in view of the fact that the enemy has only been strengthened in his desire to gain ground by the withdrawal of the front in the sector of our 1st Army. But, the main pressure of his attacks will be exerted from a northerly, rather than from a northwesterly, direction as during the past few days. It is, moreover, not at all beyond possibility that the enemy, if he reckons on our withdrawal behind the Aisne, will launch his strongest attacks east of the Argonne in order to force the fall of the Brunhild position by a flank thrust. Sufficient forces are at the disposal of the enemy for such purposes.
>
> On the other hand, the combat strength of our own divisions, almost all of whom have fought with outstanding distinction, is now seriously reduced through depleted numbers and lack of rest, as a result of the continuous hostile attacks. On the basis of past experience, we shall have to withdraw at least one division a day from the forces west of the Aisne as unfit for further service.
>
> The supply of fresh forces is at present scanty. The defensive strength of the front must be kept up to the required minimum. In case this last is not possible, it is to be expected that the Army, even with the utmost efforts and self-sacrifice, will soon be unable to carry on the defensive on the scale it has done heretofore.

GERMAN RESERVES ADVANCING TO BATTLE
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Combat values of the divisions:

200th Infantry Division: At present incapable of defensive combat.

213th and 17th Infantry Divisions: Still capable of combat.

203d Infantry Division: Fighting value seriously deteriorated, but still capable of combat.

3rd Guard Infantry Division: At present incapable of defensive combat.

15th Bavarian Infantry Division: No longer capable of combat.

195th Infantry Division: Up to full combat strength.

I have here included only the divisions that are of interest for this narrative.

In the War Diary for the Army Headquarters of the 3d Army we find the following entry, dated October 5:

In the sector of Group Py several hostile attacks collapsed under our fire. A penetration southwest of Orfeuil was foiled by the immediate counterattack of elements of the 1st Bavarian Infantry Division who, without awaiting orders, hurled themselves against the enemy. *Captured enemy documents indicate the American 2d Division as an especially reliable assault division. According to these orders the American 2d Division has been employed here because this portion of the front is considered the point on which the decisive blow of the present offensive will be struck.* Strong traffic observed opposite Group Py indicates that fresh troops are being brought forward.

As is shown on Map O, the village of St. Etienne and Blodnitz Hill were not included in the Fourth Main Line of Resistance. Consequently, the units assumed that these two main points were not to be occupied on the morning of October 5. Major Reiss, regimental commander of the 31st Bavarian Infantry, which had heretofore so tenaciously defended and held Blodnitz Hill, communicated at 6:52 A.M. with the 200th Infantry Division:

The 1st Battalion, 149th Infantry Regiment, has moved in and has completed the relief of the 31st Bavarian Infantry Regiment. This regiment is now moving to the rear. *Up to this hour, we have occupied Blodnitz Hill in front of the Fourth Main Line of Resistance.*

The operations officer of the 200th Infantry Division immediately answered by telephone: "Please relay the following order to the 149th Infantry Regiment: Blodnitz Hill will be securely taken possession of." But at 7:00 A.M. the adjutant of the 31st Infantry Regiment reported that this message could not be put through. Thus, simply as a result of an error or oversight, the hotly contested Blodnitz Hill was for a time voluntarily evacuated.

Yielding to the pressure of the French, the 5th Reserve Jäger Battalion at 6:30 A.M. retreated as far as the north edge of St. Etienne. The other Jäger Battalions had also occupied positions north of St. Etienne. Finally, at 6:57 A.M., the operations officer of Group Py called up the 200th Infantry Division: "You will issue an order that the south edge of St. Etienne be immediately occupied." Thereupon the 200th Division at 7:02 A.M. gave orders to the Jäger Brigade that the south edge of St. Etienne and Blodnitz Hill were to be held. Corresponding orders were issued also to the right neighbor, the 14th Infantry Division of Group Langer.

When, at 7:17 A.M., the 2d Jäger Brigade again received orders that the new line was to be Arnes brook–south edge of St. Etienne-Blodnitz Hill–point of contact with the Fourth Main Line of Resistance, it answered that the 4th Jäger Regiment was within the new line but that the Americans were already closely in front of it. At 7:30 A.M. the commanding officer of the Jäger Brigade, Colonel Lehmann, reported:

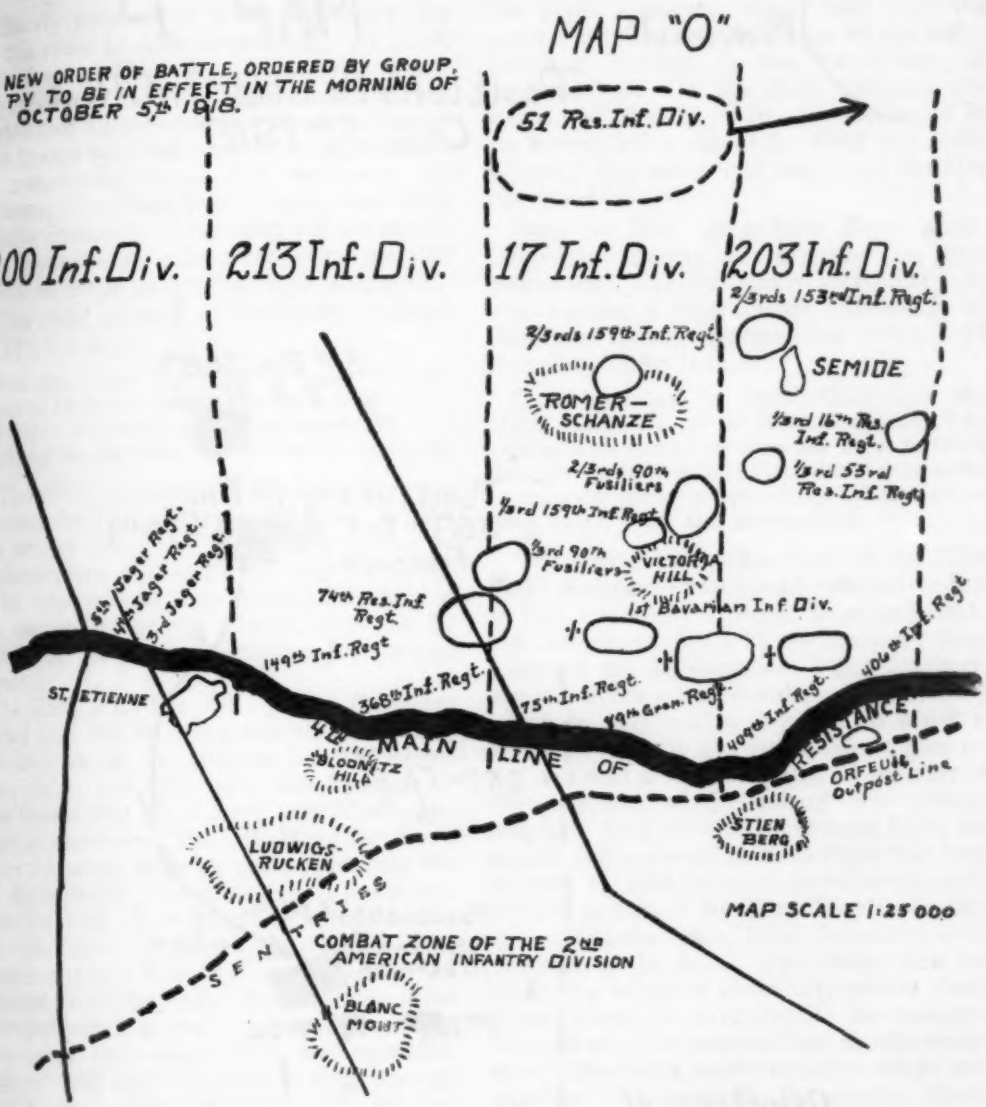
The line, south edge of St. Etienne–etc., is getting to be too long and it is impossible to hold it. The 4th and 3d Jäger Regiments have a combined total strength of only 170 men, approximately 100 of whom will be needed for outpost garrison, line battalions, and rest battalions. We are absolutely unable to ward off another attack, and cannot guarantee the outcome.

Thereupon the operations officer answered:

Place only sentries at points south of St. Etienne. Put the rest of the men in the Fourth Main Line of Resistance.

At 8:22 A.M. the operations officer of the 200th Infantry Division again reported to Group Py:

We cannot guarantee the holding of the sector. Here are our strengths: 4th Jägers, 120 men; 3d Jägers, 150 men; 5th Jägers, from 90 to 100 men. Mentally and physically, the troops are worn out. Means of communication and mounted messengers are gone entirely. By



9:15 A.M. Blodnitz Hill had not yet been occupied by the 149th Infantry Regiment, but we are told that the regiment will now ascend the Hill.

At 10:15 A.M. the Jäger Brigade reported that it had relinquished its command over the left sector (149th and 368th Infantry Regiments) to the 37th Infantry Brigade. It stated that the enemy in the sector of the 57th Infantry Regiment, 14th Infantry Division (the right neighbor), had advanced as far as Arnes brook with strong detachments and that barrage fire was requested on this point. In front of its own sector only hostile patrols were feeling their way forward. After receipt of this message, our artillery placed harassing fire on the south bank of Arnes brook, points south of Etienne, and Ludwigs Hill.

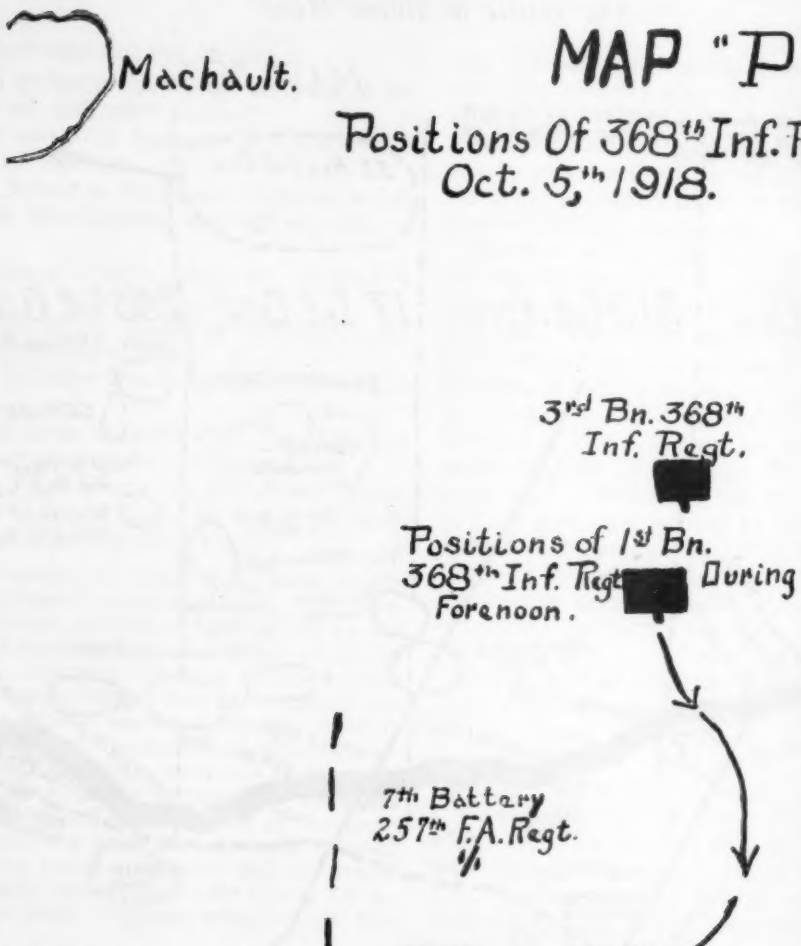
At 10:30 A.M. Group Py ordered:

The 8th Jäger Regiment of the 195th Infantry Division will be shifted into the vicinity south of Machault. It is to take up contact with the Jäger Brigade and later on relieve the 200th Infantry Division.

At 11:30 A.M. the right neighboring sector observed that the enemy had entered St. Etienne. The 8th Jäger Regiment was im-

MAP "P"

Positions Of 368th Inf. Regt. Oct. 5th 1918.


Machault.
3rd Bn. 368th Inf. Regt.
Positions of 1st Bn. 368th Inf. Regt during Forenoon.
7th Battery 257th F.A. Regt.
Positions of 1st Bn. 368th Inf. Regt. in the Afternoon.
5th Co.
6th Co.
Cemetery of St. Etienne
Sector of 149th Inf. Regt.
2nd Bn. 368th Inf. Regt.
90th Fusilier Regiment.
7th Co.
8th Co.
Blodnitz Hill.

mediately ordered to force the enemy out of this town as soon as possible. At 12:00 o'clock noon, Major von Bülow, commanding officer of the 4th Jäger Regiment, reported that his men had completely collapsed. The troops were said to be simply incapable of movement, could not recapture St. Etienne, if it had been taken, and were equally incapable of warding off an attack. The commanding officer requested that the attack be made by the 8th Jäger Regiment.

The chief of staff of Group Py reported at 12:15 P.M.:

> The 8th Jäger Regiment is being brought forward by trucks; it has orders to support the 4th Jäger Regiment and to recapture St. Etienne and the northern bank of the Arnes brook.

The 200th Infantry Division therefore requested the 195th Infantry Division to have the trucks drive the 8th Jägers as far as Hohenzollern Hill and order two battalions to be employed in lines immediately behind the sector of the 4th Jägers, with the 3d Battalion, 8th Jägers, following just behind them.

At 2:00 P.M. the 4th Jäger Regiment stated that the alarming reports concerning the capture of St. Etienne by the enemy were false, and that, after investigation, it was found that there were only hostile patrols in the town. The 5th Jäger Regiment reported weak sentries scattered along the St. Etienne–St. Pierre road. In the meantime the 11th Jäger Battalion, a member of the 4th Jäger Regiment, had despatched Lieutenant of Reserves Freytag to enter St. Etienne from the east. He dispersed a far stronger hostile patrol, reached the southern section of the village in a well-executed, dashing raid and remained in that position until he was relieved at night. The 4th Reserve Jäger Battalion, arriving first, was shifted to the boundary of the right sector. In this sector, the French 22d Infantry Division at about 4:00 P.M., advancing in several assault waves, attacked the lines of the 56th and 16th Infantry Regiments. At one point the French succeeded in entering the Main Line of Resistance; a counterattack immediately ordered was unsuccessful. The 14th Infantry Division therefore decided not to throw the enemy out until the following morning.

At 1:00 P.M. Group Py had issued orders that, during the night of October 5 to 6, the 8th Jäger Regiment would take over the command in the former sector of the 200th Infantry Division; it was stated that, as early as 1:20 P.M. the 213th Infantry Division had already taken over command in the former left sector of the 149th and 368th Infantry Regiments and in that of the 51st Reserve Division.

Now we hear again from Blanc Mont. Despatched during the forenoon (no hour mentioned), a carrier pigeon arrived at 1:30 P.M. bearing a report from Lieutenant of Reserves Gerch, commanding officer, 2d Battalion, 149th Infantry:

> Have been here on Blanc Mont since last night, completely cut off from all contact. Two attacks launched by my men last night to break through the hostile lines toward our rear failed because the enemy is too strong. Please let us have relief, food, and ammunition.

Thereupon, Lieutenant Horn of the 221st Field Aviation Detachment received orders at 1:45 P.M. to fly to Blanc Mont and establish communication with the scattered remnants of the 2d Battalion, 149th Infantry. He was given a sealed order of the division which he was told to drop off, in which it was stated that it was impossible to give relief and that a break through to the rear in the direction of Petersberg was recommended. At 3:45 P.M. Lieutenant Horn returned and reported that his flight had been in vain. He said he encountered strong anti-aircraft activities on Blanc Mont; our own troops (2d Battalion, 149th Infantry) were nowhere to be seen. The officer flew his plane at a height of about fifty meters above Blanc Mont, received hostile machine-gun fire, and when he returned had about twenty-five bullet holes scattered over wings and fuselage. Undoubtedly the carrier pigeon had been released from Blanc Mont very early in the morning, was scared out of its wits by the artillery fire, lost its way and consequently reached its loft with several hours' delay.

How was the situation on October 5 on Blodnitz Hill? This hill had not by any means, as was reported by the 31st Bavarian Infantry Regiment, remained completely unoccupied. During the night, the 2d Battalion, 368th Infantry Regiment, had occupied a substantial portion of Blodnitz Hill and had at the left contact with elements of the 200th Infantry Division. The western slope of the

hill, however, remained temporarily unoccupied, for the 1st Battalion, 149th Infantry Regiment, was located with its right flank at the cemetery of St. Etienne, and the 3d Battalion, 149th, located at its left, had been so weakened by its losses on Blanc Mont that at first it was unable to expand its sector as far as Blodnitz Hill. But at 11:00 A.M. this battalion had also sufficiently recovered to enable it to occupy a gap on Blodnitz Hill that was about two hundred meters wide. Thus the hill was again occupied by a continuous front line of our own troops.

The 1st Battalion, 149th Infantry, stated:

Around 10:00 A.M. the Americans attempted to advance from Ludwigs Rücken to St. Etienne with great masses of assault detachments but were warded off by machine-gun fire with heavy losses. Stronger elements of his assault detachments continued, however, to lodge within our outpost area, especially from the south exit of Etienne to the depression that extends as far as Ludwigs Rücken.

At about 12:00 o'clock noon, the enemy, with strong forces, moved across the hills located south and southeast of St. Etienne and after a short preparatory fire, attacked Blodnitz Hill and St. Etienne. The 1st and 3d Battalions, 149th, and the 2d Battalion, 368th Infantry Regiments, warded this attack off. On this occasion, according to reports from the 1st Battalion, 149th, the enemy made use of cavalry, which rode against its lines in the form of strong patrols and were repelled with heavy casualties. These may very likely have been mounted reconnaissance patrols of the 6th Marine Regiment.

During the afternoon it was observed that the enemy continued to bring up fresh forces. As we now know, it was the American 6th Marine Regiment which by this time was located in the front lines at the left of the American 23d Infantry Regiment. The Germans warded off an attack against Blodnitz Hill which was launched at about 4:00 P.M.

We have already seen that on October 5 the right neighbor of the American 2d Division was unable to keep abreast of the latter, and that in fact the commanding general of the French 21st Army Corps was genuinely worried about his situation. Of this situation, the Germans reported briefly:

Several attacks against the sector of Group Py collapsed in our artillery fire. A local penetration in our lines southwest of Orfeuil was immediately smoothed out by the determined counterattack of the 1st Bavarian Infantry Division, whose men, without awaiting orders, hurled themselves against the enemy.

Early in the morning, the 2d Battalion, 4th Bavarian Infantry Regiment, of the sector of Group Perthes, reënforced by one company of the 13th Infantry Regiment, attacked hostile positions southeast of Monthois in a lively drive, penetrated them to a depth of one kilometer, and captured 47 men. They continued to hold the captured ground as an outpost area. Hostile detachments that later on felt their way forward into this terrain were repulsed.

Following a strong artillery preparation at noon, the enemy attacked the entire front of the 3d Guard Infantry Division and the 199th Infantry Division. The main pressure of this attack was directed on Liry Hill against which, —fifteen attack waves strong—they hurled their troops vainly. Running directly into a well-directed, especially effective artillery fire, his assault detachments, suffering tremendous losses, retreated as far as points in rear of Schwerin Hill. We recognized a renewed assembly area of the enemy and at once launched an effective, concentrated artillery fire on that point. In the defense of Liry Hill the companies of the 357th Infantry Regiment especially distinguished themselves; their tenacious resistance wrecked all the enemy's earlier attacks. One of the company commanders, Lieutenant of Reserves Marock, was a splendid example of steadfastness to his men during the most critical hours of the defense.

The commanding general of the 213th Infantry Division, all of whose troops had at last been reunited, issued the following order of the day:

Once more the 213th Infantry Division, heretofore continuously employed at scattered portions of the front, has come under my command as an independent unit. Much has been undergone, still more must be undertaken. Let us not forget that our sector must be kept absolutely clear, come what may.

The divisional order further outlined that the 74th Reserve Infantry Regiment had been designated divisional reserve and that to each of the front line regiments was to be attached a tank-defense battery, with an accompanying battery for the reserve regiment. It was intended to employ the 3d Tank Detachment, scheduled to arrive on October 6, for counterattacks, in case the enemy accomplished a deeper penetration of the front lines.

In its report of October 5 concerning the

combat value of the division, Army Headquarters, 3d Army, repeated the statements already made on October 2 regarding the condition of the 3d Guard Infantry Division, and gave its opinion regarding the remainder of the divisions as follows:

The 200th Infantry Division, since September 26 engaged in serious combats, has suffered heavily. There are grave doubts as to whether this division should be left longer in lines. At the present time the combat strength of the three Jäger Regiments has shrunk to a total of 500 men.

The 51st Reserve Division has no further combat value. Exhausting night marches prior to its employment and the last eight major combat days have worn its men out completely. According to last reports, the 234th Infantry Regiment has assembled a remnant of 150 men, the 235th about 350 men, and the 236th about 150 men, which numbers include staffs, machine-gun units, etc.

The 203d Infantry Division is in practically the same condition. The heavy losses have considerably decreased the number of officers, enlisted men, and horses of battalions and batteries. It is necessary that the 410th Infantry Regiment be reorganized. Success in warding off the recent hostile attacks has raised the morale of the men, and confidence prevails despite their weariness.

The 213 Infantry Division maintains the excellent combat value displayed during yesterday's attacks, in which the 149th Infantry and the 74th Reserve Infantry Regiment were engaged in efforts to hold Blanc Mont and block the points of penetration at Médéah Hill. It must, however, be assumed that these bitter combats have been accompanied by considerable casualties.

The 195th Infantry Division: Health and morale satisfactory. This division is fully able to engage in defensive warfare.

The 15th Bavarian Infantry Division: Not a single unit of this division is capable of combat.

The following order was issued at 1:15 P.M., October 5, by Headquarters, 3d Army:

At a number of points along our front our infantry, after repulsing major attacks of the enemy, has repeatedly pursued them into their own lines. Also several attacks, launched for the purpose of improving our own front lines and the attainment of certain objectives, have been carried out with great success. Among others, the following regiments have especially distinguished themselves: Infantry Regiment Count Bülow von Dennewitz (the 55th), the Guard Füsilier Regiment, the 74th Reserve Infantry Regiment, the 149th, 406th, and 409th Infantry Regiments, the 199th Infantry and the 4th Bavarian Infantry Division, as well as the heroic Jäger Battalions of the 200th Infantry Division. *All divisions will exert particular efforts to make it plain to the men in lines that by offensives at all points the enemy must again be brought to feel the necessary respect for our troops.* According to statements of prisoners it appears that the enemy is worn out and has suffered heavy losses. We must therefore, all the more, show that our combat strength is still unbroken. I shall call the attention of higher authorities to all divisions that especially distinguish themselves during the coming offensive operations.

In the evening of October 5, the commander in chief of the 3d Army, General-Oberst von Einem, despatched the following wireless message to Group Py:

His Imperial Highness the Crown Prince, commander in chief of the Group of Armies, German Crown Prince, has requested me to convey to all troops his appreciation and greetings for the valor manifested during the repulse of today's hostile attacks.

Signed: VON EINEM, General-Oberst.

His Majesty the Kaiser, on October 5 issued the following order, which was to be made known to all troops a day later but which was not to be broadcast by wireless:

TO THE GERMAN ARMY AND THE GERMAN NAVY

For months the enemy, with a powerful array of reserves, has hammered almost without cessation against your lines. You were forced to persevere, often without rest, for long weeks, valiantly opposing an enemy numerically far superior to your own strength. Therein lies the greatness of the task with which you are now confronted, and which you are carrying out. Troops of all German stocks are fulfilling their duties, and on foreign soil courageously defending the Fatherland. Difficult is the lot of my Navy in its efforts to be of useful service in the face of the combined sea forces of the Allies, and in its tireless endeavor to assist the Army in its hard struggle. With pride and admiration, the eyes of the Fatherland are directed upon the achievements of the Army and Navy.

To you I express my own gratitude and that of the Fatherland. In the midst of this struggle for existence comes the collapse of the Macedonian front. Yours is still unbroken and will so remain.

In agreement with our Allies, I have once more decided to offer terms of peace to the enemy. But only to an honorable peace will we consent. This we owe to our dead heroes who have sacrificed their lives for us; this we

owe to our children. Whether arms will rest is still undecided. Until then we must not cease in our efforts; we must, as heretofore, give all our efforts tirelessly to withstanding the onslaught of the enemy. The hour is grave. But, trusting in our strength and God's gracious help, we feel strong enough to defend our beloved Fatherland.

Signed: WILHELM IMPERATOR, REX.

Before we take up the events of October 6, at least one critical comment appears necessary. We have seen that during the forenoon of October 5, St. Etienne was partly occupied by enemy patrols and partly unoccupied, and that behind it were located the completely exhausted Jäger Regiments, each one of which had only about the strength of one company. If, on that day, Major General Lejeune had launched an attack with his entire division, not only the village but probably also the positions behind it would have fallen into the hands of the Americans. But General Lejeune had no way of knowing this. And even if he had known, and had believed the report of the French 118th Infantry Regiment, which, however, arrived only late in the afternoon after the fresh 8th Jäger Regiment had come up—then what? Major General Lejeune had had such hard going with his two French neighbors that he would perhaps have hesitated even then to drive another wedge pointed by American troops beyond the rest of his front, a wedge which would at once have been subjected to strong German flank attacks. In addition it should be remembered that Blodnitz Hill, then held by the still very able 2d Battalion, 368th Infantry Regiment, might have proved a thorn in his side. Its garrison would have been in a position to hurl strong flank attacks against the Americans had they advanced in attack against St. Etienne, and would have made this assault a costly undertaking.

(To be continued in the next issue)

The Nicaraguan Policy *of the* United States

By LIEUTENANT RAY D. TARBUCK, *U. S. Navy*

THE recent activities in Nicaragua have brought before the public the policy of the United States. Or rather, it has made the average newspaper reader ask himself, "What is the Nicaraguan policy of the United States, and why is it so?" He reads of landing forces and of pitched battles, of debates in the Senate, and of investigations by the committee on foreign affairs. The naval and marine forces carry out the policy to the letter, and with an iron hand, regardless of whether or not the personal views of those officers agree with the policy. That is devotion to duty, love of country, and loyalty. It seems fitting that professional politicians, statesmen, and yellow journalists should develop a similar loyalty to country. I mean that when such a crisis arises personal gain and party devotion should be abandoned while the national policy is under discussion. I believe many of our public officers are, and have been, big enough to do just that. The following pages are based upon Nicaraguan history and personal observations in that country, not upon the discussions in Washington.

POLITICS AND ECONOMICS IN NICARAGUA

The population of Nicaragua consists of whites, blacks, Indians, and mixtures of the three, speaking the Spanish or the Indian languages, and being of Christian faith. As far as color goes all classes mingle, apparently upon an equal social basis. There is, however, a dividing line of wealth. The wealthy and educated Castilians (more or less) lead the political parties. The traditional civil wars, which in early days were wars between cities, are now between the so-called Conservatives and Liberals, which, since those in power are rarely consistent in platform, amounts to a war between those in power and those out of power. Most of the wars are a struggle for greed by the leaders, followed by the "sheep," who really have no political interests. Such followers join the active forces for love of excitement, because they are pressed into service, because their town is openly at war, or through loyalty to a leader. If they win, the leader gains in power, his soldiers in loot. If they lose, the leader usually deserts his soldiers when they need him most.

It is a common occurrence for the party in power to exclude from the polls all political opponents or suspects in order to insure reëlection. It was the object of the free election of 1928, held under the supervision of the United States forces, to eliminate such fraud and intimidation. This little, turbulent state also draws attention in external affairs because of its adaptability to an inter-oceanic canal, the option for which now rests with the United States. The population is largely composed of city dwellers, leaving the plains of the West and the jungles of the East to the Indians. It is composed of 600,000 people spread over 49,000 square miles. Three-fourths of these people occupy the narrow strip, averaging twenty miles in width, which separates the great central lake from the Pacific Ocean. To the east live the less ambitious and more peaceful classes. The city dwellers, even to the laborers, are always ready to follow a favorite chief into battle. The chiefs have always been members of prominent families, whose intermittent rule runs back to the days of independence. The chiefs may have the good of their country at heart but some at times betray their people and their trust, selling valuable concessions to foreign interests to promote their own ends and leaving office with an empty treasury and a larger national debt. Some of the blame for this must fall upon Americans competing for mineral, agricultural, and transportation rights. An example of the latter is the financiers of the Accessory Transit Company in 1856, at which time the wars were practically directed by Mor-

gan and Garrison, who backed the filibusters, and by Cornelius Vanderbilt, who endeavored to destroy them, each side plotting and intriguing to obtain control of the New York to San Francisco traffic, which at that time was by boat to Greytown, up the San Juan River, across the lake, overland to the Pacific, and then by boat up the West Coast. William Walker, an adventurous American, was the puppet who eventually paid the bill with his life. He became dictator and went to war with his political enemies. This conflict drew into it Costa Rica, Guatemala, Salvador, and Honduras, with six armies in Nicaragua (four of them foreign) at the close of the war. Walker had been victorious at first but a Vanderbilt agent, under British encouragement, directed the Costa Rican force which crushed him. As the war ended Costa Rican forces decided to remain and peace again was only an ideal. Thus individual American influence, and for that matter other foreign influence also, has started a few quarrels and ended a few more. So we are not altogether blameless. This, however, was mostly in pioneer days and does not exonerate the line of Nicaraguan dictators who have abused their privileges and sold their country for many years.

The longest stretch of time in Nicaragua during which there has been no successful revolution has been thirty years. This comparatively long period was due to a Conservative government started by Martinez, who held office from 1863 until 1867. It was an alliance of Conservative factions. At first, as a precaution against foreign invasion, Martinez formed a coalition with the Liberal Jerez but, after an unsuccessful revolt by the latter, he was succeeded by a line of competent Conservative presidents. These were more interested in the welfare of their country than in their own reëlection. They were Guzman, Cuadra, Chamorro (Pedro), Zavala, Cardenas, Carazo, Osorno, and Sacasa (Roberto). Their rule was marked by social and enonomic progress. Railroads, schools, and farms sprang up. It was the direct result of unity of purpose and of tolerance toward each other. Their union expelled jealousy among the leaders and the ship of state went sailing free until 1893. In that year Roberto Sacasa reopened the spoils system and treachery and revolution took charge. That thirty-year rest proves that peace in Nicaragua is possible. But it further proves that it is only possible so long as the office holders have a sense of public honor, and so long as military and political groups are separated. The ease with which governments are controlled over night by the use of the standing military forces of a country is amazing. The recent shifts of control or establishment of dictatorships in Greece, Italy, Turkey, Spain, Russia, and Hungary are specific examples. Always has the chaos in Nicaragua been connected with an ambitious minister of war who also held a commission in the army. The fathers of the United States in organizing the government guarded carefully against military dictatorship and it is not too late for the smaller republics to follow suit. Sacasa was followed by Zelaya, who made himself an absolute ruler and held the power as such for sixteen years, for he realized only too well that military activity could keep him in power. His other mainstay was to play his enemies against each other. But he also used diplomacy and tact and sought to increase the education of the younger generation by school improvements. On the other hand, he and his cabinet looted the resources of the country and printed currency until the country was flooded with stage money. We see, then, that the little republic has been exploited from within and from without, producing no one strong enough and idealistic enough to crystallize it into a stable and progressive state. Many doctors have ordered cures but none will be a real remedy unless it reduces considerably the promotion of factional interests and the abuse and subjugation of political enemies.

The plain regions about the lakes produce corn, beans, sugar, cacao, plantains, coffee, and cattle. The mountains of the central section are dotted with mines producing gold, silver, and other precious metals. The eastern section abounds with lumber and bananas. The rivers of the east are the only means, except a few trails, of transportation through the jungles. There is, however, a short railway at Puerta Cabezas belonging to the Bragman's Bluff Lumber Company. Each river has at its mouth a five- or six-foot sand bar carefully constructed by nature to prevent sailing out of the deep rivers with the nation's resources. The lumber, mining, and banana concessions

are in the hands of foreigners, and the state itself never realizes enough revenue from these large resources to buy back its concessions, nor to operate its own mines, nor to dredge away its sand bars. The possibilities of the country are considerable. Foraging parties and bandits inflict large losses upon the farmers, and Indian lands have been sold by careless officials, without the right to do so, all contributing to the general economic collapse. Indians refuse to work for small wages upon the plantations which by right are their own property. This causes a scarcity of labor. They have been at times forcibly recruited to harvest in an attempt to save the situation, whereas the introduction of modern farm machinery and labor-saving devices would be the proper method of keeping up the output.

The East Coast has long considered itself distinct from the central government in the West. This spirit exists because of its separation from the West by mountains and jungles and lack of communications. Any revolutionist can enlist the East in his support. They are naturally "agin the government." They pay revenue to the government and northern East Coast towns pay import duties at Bluefields, a port on their own coast. In return they get nothing—nothing but a *jefe politico* imposed upon them for fleecing purposes. It is a plain case of taxation without representation. Secession would be ideal for the eastern towns but of course not for Nicaragua as a whole. At Principulco I was told that the Conservative army which invaded the Liberal territory uprooted the street lights in the city of Bluefields, carried them off, and installed them in a western town. Intercity hatred is an old sore in Nicaragua. Managua and Granada, the Conservative cities, and Leon, the Liberal seat, are all too proud. The United States could not long endure with Denver confiscating the public property of New York—nor can Nicaragua. I doubt if the East will be relieved of oppression even though their candidate has become the president, because their expectations are based upon hopes, and not upon the possibilities of victory. For once a Nicaraguan is in office, personal gain becomes more tempting. There is much room for improvement in the East. The rivers are deep but barred, few trails connect with the interior, there are no railroads between towns, and the beach is the only north and south highway, with the jungles growing almost down to the water's edge. Bananas must be boated out into the open sea to Man o' War Cay to be loaded upon the larger draft ships. Men like "Colonel" Baker, famous along the Mosquito Coast for his knowledge of bananas, give an unconscious analysis of the economic conditions when they are Conservatives for the security of the plantation concessions and Liberals because of the poor fruit and mahogany handling conditions. When the last revolution was nearing an armistice, Mr. Baker said to a westbound traveler, "If you see Admiral Latimer, tell him to tip off Managua to spend a dime on the East Coast." He was afraid that even the eyes of the nonpartial investigators would fail to see why Sacasa had been able to raise such a large army east of the hills. The East until 1894 enjoyed practical independence, as a half-breed protectorate of Great Britain, known as the Mosquito Kingdom, but became an inseparable part of Nicaragua when the United States refused to recognize the British right to encroach upon the sovereignty of the little republic. In that section the Spanish type of people is scarce and probably for that reason it has been more peaceful. There are Negroes and Zambos, the latter being a mixture of Negro and Indian, the original Suma Indians having moved farther inland in a peaceful manner to make room for the blacks along the shore line. Thus we find the East quite primitive, with families living in hollow tree canoes and thatched huts, while the West, with their lake transportation and railroad to Corinto on the coast, have forgotten them. Development under such odds, the salvage of Nicaragua, evidently rests upon her relations with the United States.

Perennial Civil War

Before entering upon the features of relations with the United States it may be of value to diagnose Nicaragua's chronic illness—revolution. This question naturally ranks first, being the biggest menace to progress. Civil war has become a Nicaraguan characteristic, a political institution. The continual conflict almost since the day

of independence has caused social and economic stagnation. Misrule resulted primarily from the predominance of military elements fostered by the victors, and the military leaders out of power cannot stand long periods of inactivity for their very existence depends upon internal disorder. The seeds of revolution are political ambition, treasury loot, abuse of power, desire to hold office by many, and revenge upon political opponents. Because of the ignorance and indifference of the majority and the lack of self-governing experience among the rulers it has been repeatedly impossible to hold just elections. Through custom, popular election of officers has become a farce and the people have literally adopted civil war as a political system, for the party in power usually manipulates the election machinery for its own reëlection.

Because of the common occurrence of revolutions they now cease to interest or encompass a large number of the population. Nor do they settle any momentous questions vital to the issues of the day. There is ever an element ready to jump the traces, and it has become the right of any well-equipped band of men to take office. The fighting equipment is secured from filibusters, neighboring governments, foreign corporations, or speculators who wish to overthrow the government and force special concessions or privileges. The army in its path presses the inhabitants into service. This results, of course, in an immediate paralysis of agriculture and commerce. The rest of the country is phlegmatic enough to look on without being able to check the conflict in the interest of peace. Atop of those carried by the tide of war are the pure blooded descendants of the Conquistadores. They are die-hards and, perhaps, justly so, for the "outs" are rarely ever treated with fairness by the "ins."

The upper class is naturally drawn toward politics, since farming is still an unattractive occupation. They are the propertied class and work up a following of half-breed artisans who see an outlet for excitement, profit, and loot, because they have no advantage of superior education, of wealth, or of social prestige. The followers become attached to their chiefs through *personalismo*, or to their community at war through *localismo*. The half-breeds have been blamed for many ruptures of the peace, but as a class, like the full-blooded Indians, they are peaceful, law abiding, and more industrious than those of Spanish descent.

The barriers to peace, then, are the impossibility of fair election, the habit of warfare through personal feud or town jealously, and the inertia of the people who, though they do not desire war, cannot prevent it. These obstacles will be removed in time, when the general mass becomes educated and assumes an interest in public affairs; and when the existing government is able to keep out the foreign mercenary soldier, the adventurer who sells his services to the highest bidder.

The American Policeman

Intervention by the United States means the eventual cessation of hostilities. This is sometimes accomplished by peaceful intervention, such as the mere statement by the United States as to which party will be recognized, as well as by the use of force. Upon several occasions the United States has intervened decisively in Nicaraguan politics. This has resulted in the gradual assumption of the control of customs, railways, currency, and internal revenue by American bankers who had lent money during early periods of reconstruction. In 1909 diplomatic relations were severed because of the execution of two Americans by Zelaya (Liberal), the president and dictator. Incidentally, he had conquered the Mosquito Reservation and incorporated it into the Nicaraguan Republic. The break was the culmination of a long line of incidents straining the relations between the two countries. Among these were Zelaya's violations of the Washington conventions, and the dispute of the Emory claim. It threw the weight of the United States with the city of Bluefields, then in revolt. Zelaya had kindled many a fire of revolt in Central America, and American citizens in Nicaragua were now left without the protection of either federal or revolutional authority. Our opposition caused Zelaya's resignation in favor of Dr. Madriz, of Leon. The latter was well known and able but did not enjoy the favor of the United States, for the appointment of a Liberal of honesty and of good reputation by Zelaya was considered a ruse to placate the United States, the forces of which now broke his blockade of Blue-

fields, and refused his commanders permission to bombard the town. The bout was over. Estrada, governor of the East Coast Province, rose against Madriz, moved on to Managua, and became provisional president. This also brought into power Moncada, a Liberal but an opponent to the unseated Zelaya. He became minister of *gobernacion*. Mena, a Chamorro follower, became minister of war, but he and Moncada were not trusted by the Conservative Granada aristocracy (Chamorro and Cuadra), who hoped to reap the spoils of the revolution. These old Conservatives feared that the fallen Liberals would be succeeded by more Liberals. Their families had ruled before Zelaya and the return to power was sweet. But jealousy even forbade a union of the Conservatives, for Chamorro was opposed by the Cuadra family, destined to power through alliance with Adolfo Diaz. This recalls to us that Nicaragua is the arena of fights to the finish between families, as well as between parties, towns, and coasts. The truce agreement which made Estrada provisional president had guaranteed peace, a free election, and recognition of personal debts. No one bothered much about the peace and the free election, but took very seriously the payment of debts. The latter took the form of grievances. Both sides divided the contents of the treasury as compensation for past injuries, some of which were lost property and others merely moral injury. The Conservatives received large tracts of government land, and the treasury left by Madriz was empty. In getting the golden eggs they killed the goose. The currency became inflated, with the consequent ruination of commerce, crops, cattle, and transportation. Apropos of this, claims filed as a result of the last struggle in 1927 between Sacasa and Diaz amount to more than twice as much as the country can pay. The money for these payments will be diverted from public improvements to pay for property destroyed or commandeered by both federal and revolutionary armies. What the damages might have been, had the United States Navy not forced an armistice, are beyond guessing. To return to the previous instance, in the chaos the Liberals saw their chance to come back, whereupon bedlam broke loose. The assistance of the United States was urgently needed and it came in the form of an emissary who concluded peace, formed a claims commission, and negotiated an American loan.

But trouble doesn't end in Nicaragua, for Estrada dissolved the Constitutional Convention (all Chamorro followers), for its attempt to seize power, and tried to imprison General Mena, his minister of war, for using military pressure. He thus broke with his ministers and was succeeded by Adolfo Diaz, the vice president. Moncada, who was minister of *gobernacion*, now resigned. In 1911 the United States agreed to assist in cleaning up the national debt. Loans were secured from American bankers. Receipts from the customs were to retire the loans. The *cordoba* or Nicaraguan dollar was instituted. Incidentally, one traveling there is quite annoyed by the high value of this money. Backed by American loans it seems to be at par even during hostilities, even when business seems to be at a standstill. There the American dollar, which we like to believe buys so much, only brings in exchange two bottles of warm beer, much to the bluejacket's disgust. For an American accustomed to buying *francs* and *lira* the *cordoba* is expensive money. The problem of the United States was affected by the fact that the British held old bonds from Zelaya which could have been used readily as an excuse for European intervention. Through diplomatic negotiations, however, an adjustment was made, interest on debts was reduced, the broken-down treasury was again placed on the road to recovery, and Americans granted loans in anticipation of ratification of the treaty. But the United States Senate failed to ratify the loan treaty, and in consequence Nicaragua could not acquire the needed money, except on outrageous terms. The expected improvements were halted, and there was no money to call in Zelaya's bonds. England and France held the bonds, and the American creditors held the sack. With European countries holding a first mortgage upon the customs, how could the United States enforce the Monroe Doctrine? It was especially dangerous since it has been a characteristic European policy to create bad debts in the Western Hemisphere to justify the application of military force and the cracking of the Monroe Doctrine. American intervention, financial or other-

wise, is not a part of that doctrine. The policy of intervention stands upon its own feet. Nevertheless, while it causes Latin-American criticism of the Monroe Doctrine, it certainly checkmates the European move to destroy that doctrine. The failure to ratify the loan treaty, then, on the part of our Senate, was not only unwise, but apparently a breach of faith, for our own bankers, who had come to the rescue at the request of the United States itself, found themselves becoming involved deeper and deeper in the financial support of a bankrupt government.

Mena, the ex-minister of war, having lost his job, decided about this time that he himself would make a fairly good president. He took along many government troops, even the capital police, and proceeded to fight. On the verge of victory the United States intervened to protect its citizens and the railroads which secured the loans. The Conservatives were kept in power by American influence, which smothered a new revolution by demanding effective protection of foreign life and property, and then when the Nicaraguan president could not guarantee it he asked the United States to assume the responsibility itself. It was done. One scrimmage and the revolution was over. Such a procedure is justifiable in more ways than one. It prevents another looting of the treasury, and it averts the intervention and exploitation by European powers. Here we have the kernel of the Nicaraguan policy of the United States.

Since 1912 the United States has kept the elected Nicaraguans in office by a legation guard and a warship at Corinto, until in 1925, when the experiment of evacuation was tried. Here was Nicaragua's chance to prove the ability of self-government, and to show that the lessons of the disasters of years of civil war and the benefits of foreign occupation had been learned. But as soon as the American forces reduced the pressure the country blew up. Plato's and Aristotle's cycles of government do not apply to this little hot spot, for the durations of peace are usually too short to allow the government of the winning party to settle down and obtain normal characteristics. After Chamorro, former minister to the United States, became president, a treaty of vital importance was negotiated with this country. This was an agreement in 1913 providing for the payment of three million dollars by the United States to Nicaragua in return for an exclusive right to construct a trans-isthmian canal through the San Juan River and the Great Lake, and for the privilege of establishing a naval base in her territory on the Gulf of Fonseca. It was later modified in that Nicaragua agreed not to declare war without the consent of the United States; or to conclude foreign treaties affecting her independence or territorial integrity; or to contract public debts beyond her ability to pay; recognizing the right of the United States to intervene to preserve her independence and to protect life and property. The United States Senate failed to ratify the treaty, but in 1916 did ratify a new treaty, without the Platt amendment provisions, but granting the aforementioned permanent canal right by any route, a ninety-nine year lease of the Corn Islands, a ninety-nine year option to build a Fonseca naval base, and a payment of three million dollars to Nicaragua for the relief of her indebtedness. The treaty had three main effects: it sustained Nicaragua's hope of financial recovery which was previously abandoned through the loan treaty failure; it strengthened the Monroe Doctrine and precluded European politics; and it caused a spirit of distrust and a feeling of fear in the other Central American republics. While the other world powers were busy at war it was a strategic time, accidental or otherwise, to conclude such a treaty. We had learned the Clayton-Bulwer lesson, that of begging other powers for permission to build a canal. Nor had we forgotten that European nations had used the same tactics upon us by dividing up the Chinese concessions at the time when American attention was riveted upon Cuba and a first-class war with Spain. The feeling of resentment in Costa Rica, Salvador, and Honduras led to an assurance of their rights by the United States. Costa Rica and Salvador, however, remained dissatisfied and submitted protests to the Central American court of justice. Costa Rica claimed navigational rights on the San Juan River while Salvador feared the Fonseca base. The court decision favored Costa Rica and Salvador but was disregarded by Nicaragua and the United States. The court, having no jurisdiction over the latter, declined to declare the treaty void. If Nicaragua had first consulted her neighbor, with

whom she had restrictive treaties, the treaty would not have run afoul of the Washington conventions and the court of justice. These now become useless if the canal and base are built without a Costa Rican understanding. It is easy to understand the rise of anti-American feeling to the southward, just as easy as it is hard to convince them of our sincerity while we squat with force upon their neighbor. Perhaps at times they are partially justified, excepting, of course, those who are the puppets of jealous European propaganda.

Anti-Americans claim that we recognized a minority government to further our own interests. But is it fair to desert our own bankers, causing great losses, after they invested at the expressed request of Nicaragua and of our State Department for the sole purpose of salvaging a nation on the rocks? Then, too, some Liberals in the past have pledged to undo the loans by cancellation. They dislike, as anyone naturally would, the American control of railways, banks, and customs. But they forget that it is the only way their country has ever been run at a profit to themselves, and that after the loans are retired economic control and stable commerce will pass into their own hands. A portion of the revenue now goes to pay the foreign debt and the rest goes to the Nicaraguan government as gain. It is ridiculous to claim that our financial policy is an attempt to exploit the people and to fatten American pockets. The investors are sunk so deeply that they cannot pull out. Money-lending in Nicaragua is a great risk, the interest rate being about fifteen per cent, and yet producing small profits. Nevertheless the feeling prevails in certain parts that it is all a Wall Street game, and that our forces support a minority government to insure the graft. The free general election in 1928, insisted upon by the American mediator, Mr. Stimson, and Admiral Latimer, did much to eradicate this suspicion. Prior to the election General Moncada, Sacasa's "big gun" in the field, stated that his party, the Liberals would win the election (as the minor elections indicated) provided the American forces remained at the polls. That gentleman, wielding no small influence over a very large following, admitted, though he win or lose, that the United States stood for an honest deal.

American Influence

In considering the area under discussion certain points in the history of Nicaragua and her neighbors cannot be neglected, for the United States builds her Nicaraguan policy upon past performances. Incidentally, policies are easily bungled by agents, commercial and official, who adopt the holier-than-thou attitude. It carries a suggestion of imperialism. The philanthropist who approaches with an air of superiority reeks with insincerity. The tactful agent or traveler immediately brings himself to the level of his host. You can catch more flies with molasses than you can with vinegar. Sandino did not leave Moncada, his superior officer, and go on the war-path until he realized that he was not considered important enough to be consulted in the truce.

Intervention, we have seen, is necessary in support of our economic interests and to prevent European intervention. Trade with Nicaragua is greatly on the increase. That country is a part of our foreign market and a small source of rubber independent of the British monopoly. European interference is certainly not desirable so near the Panama Canal and the Caribbean. On the other hand, if such is to be prevented, we must guarantee the protection of Europeans and their property as well as our own citizens. One important result of the influence of the United States was the adoption by the Central American countries of a policy of nonrecognition of governments established by revolutionary activities. The State Department has in past years apparently had no definite, well understood, and energetically enforced policy. The tendency has been to grope along as circumstances arose. This hardly convinced the Latin-Americans of our altruism. The policy of intervention, however, has gradually, although not finally, checked the internal warfare which promised to bleed the small country to its death. Until the last war, between Sacasa and Diaz, there had been no serious disturbance since 1912. In this last struggle, which terminated in 1927, with the exception of banditry, it became incumbent upon the United States to support Diaz because of the policy of nonrecognition of revolutionary governments, notwithstanding the apparently just claims of Dr. Sacasa and the threats of senatorial investigation.

More important than the taking of sides in a conflict is the prevention of it. That is the first requisite of political improvement in Nicaragua, and will probably call for the need of occupation by the United States Marines for a long period to come. Our policy thereby imposes upon the country the rule of the elected political group by diplomatic pressure or otherwise. Above all, fair elections are needed, and to this end the American forces will supervise properly the polling. We have before us the problem of teaching the political parties to compromise and eliminate the rise of military leaders and demagogues. For while we have abolished graft in the custom houses themselves, there is nothing to prevent the misspending of that portion of the receipts which is not used for the service of the foreign debt. Moreover we should exercise a partial control of American business firms there because the financial resources of our fruit and lumber companies exceed that of the Nicaraguan government itself. There exists the temptation of dishonest methods to secure influence, which, naturally, promotes revolution. This caused the revolution of 1909. Few internal conflicts would have attained any proportion except for outside assistance.

The cordiality of our relations depends largely upon the impressions we make, and the capacity of our business men to win confidence and friendship. The bitter resentment of our policy of the last fourteen years is our own shortcoming if we have not convinced the people that our course is actuated by a desire to assist them, and not by a lust for expansion. Certainly the United States cannot be justly accused of imperialism when she refused the opportunity for protectorates and colonies so greedily divided after the World War, and when she sacrificed the open door by allowing herself to be deprived of the right to fortify and develop her Far Eastern bases by signing on the dotted line in 1922.

The educated Nicaraguans realize that each day their country is becoming more and more closely associated with the United States and that their future depends upon our policy. Political, economic, and cultural interests are closely interdependent. Improvement in communications, coffee production, and travel by Nicaraguans in the United States have encouraged these interests. An addition along that line would be the establishment in Nicaragua of a technical school of engineering and of agriculture by Americans. However, all this responsibility more or less thrust upon the United States does not remove all the burden from the Nicaraguans. They must be inspired by their own national future and take a different attitude toward one another, toward their government and their country. Otherwise America can do them no good, not even by building the proposed canal. They must bury their ancient coastal, city, and family feuds. Liberal and Conservative governments alike must be for the benefit of *all* the people. Politics must pass from a personal basis to a national basis, and the government must be a peaceful and just rule of the will of the majority. Elections must be counted in votes—not rifles. A majority government once established must be supported by *all* the people regardless of the party in office. Uprisings must be considered as treason, and the people taking part in them considered as traitors, not as patriots. They have the richest territory in Central America and its resources are sufficient to support all in comfort when developed. The people should not sit with folded hands and await the canal to solve all their cares and bring prosperity without effort. They must build roads to knit the people into a closer union, and bring about that consciousness of unity so essential to the existence of a state. Coffee planting yields more profits than civil war. For the good of Nicaragua and the United States, and to teach the lesson to other small countries in this hemisphere, it remains for the United States to shape its policy so that its primary aim will be to establish in fact the democratic institutions of Nicaragua which now exist on paper, by helping to prepare the people for an intelligent exercise of suffrage, ultimately enabling them to manage their own affairs without outside interference.

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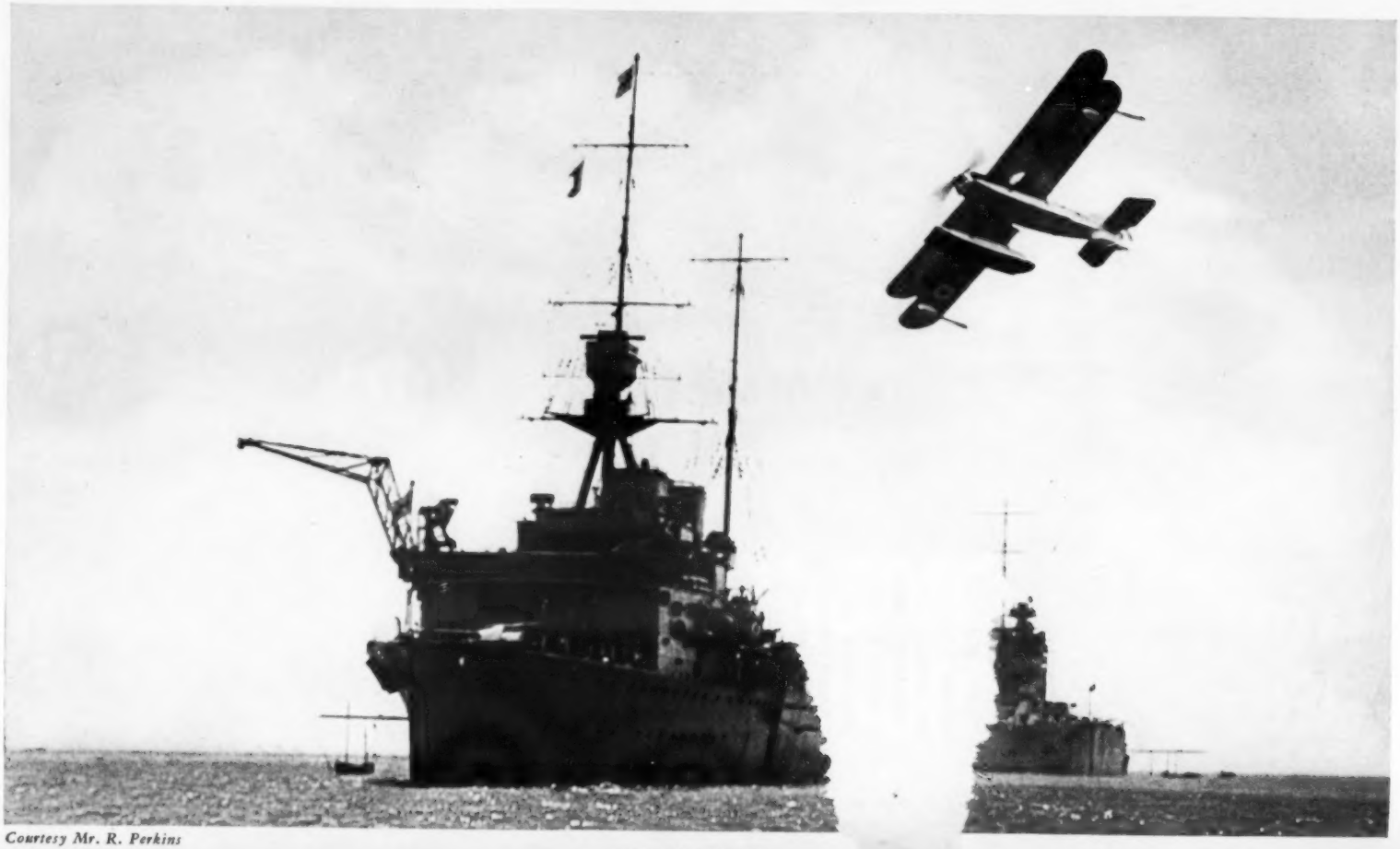
AT LAST

The first of the Washington Conference type of cruiser to be commissioned for the U. S. Navy. U.S.S. *Salt Lake City,* 10,000-ton light cruiser, was commissioned at Philadelphia, Pennsylvania, on December 11, 1929, some eight years after the conference.



Courtesy Mr. R. Perkins

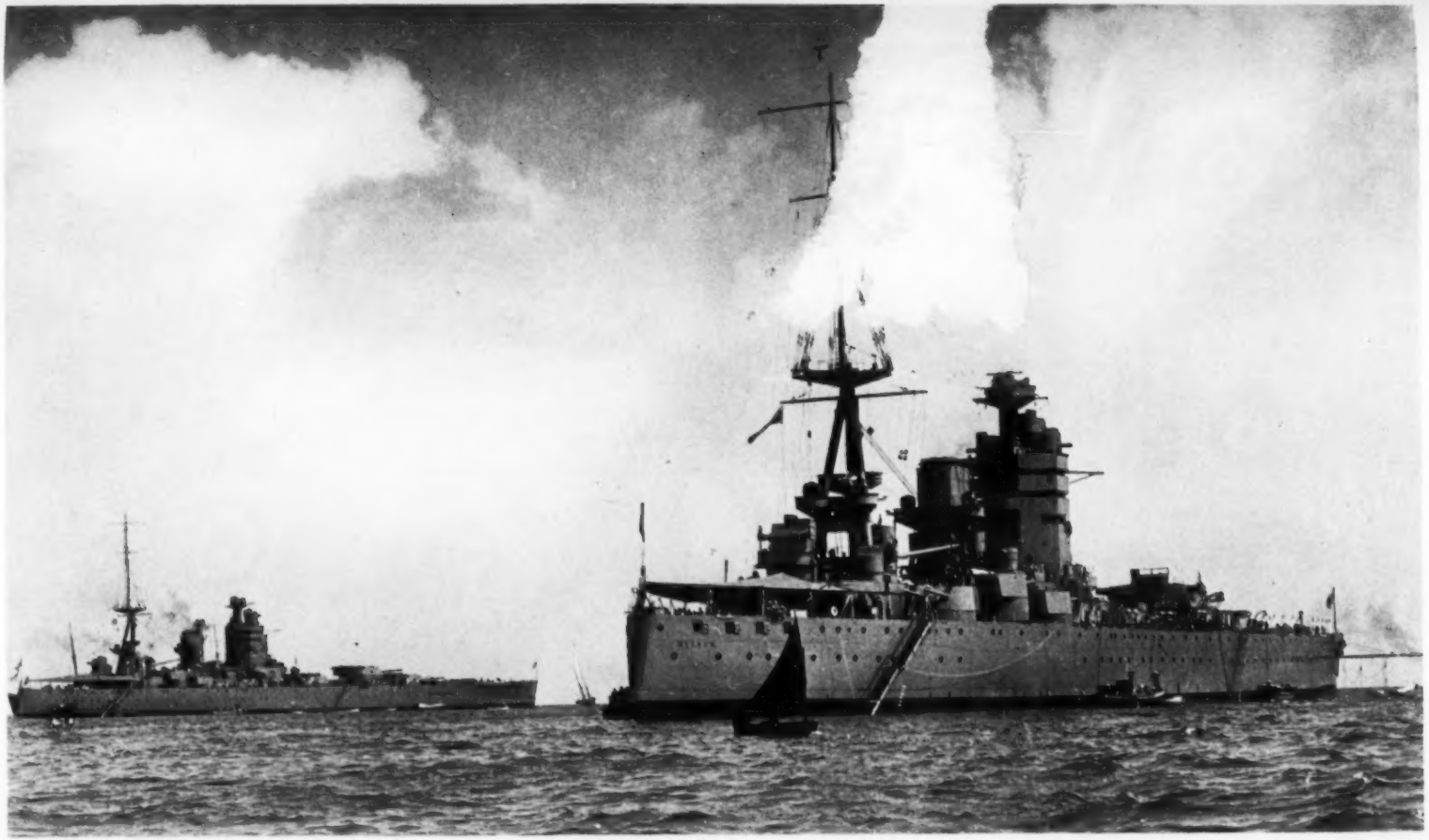
AVIATION ABROAD

Seaplane flying over H.M.S. *Vindictive* and H.M.S. *Rodne*[illegible] (ground).

Courtesy Mr. R. Perkins

AVIATION ABROAD

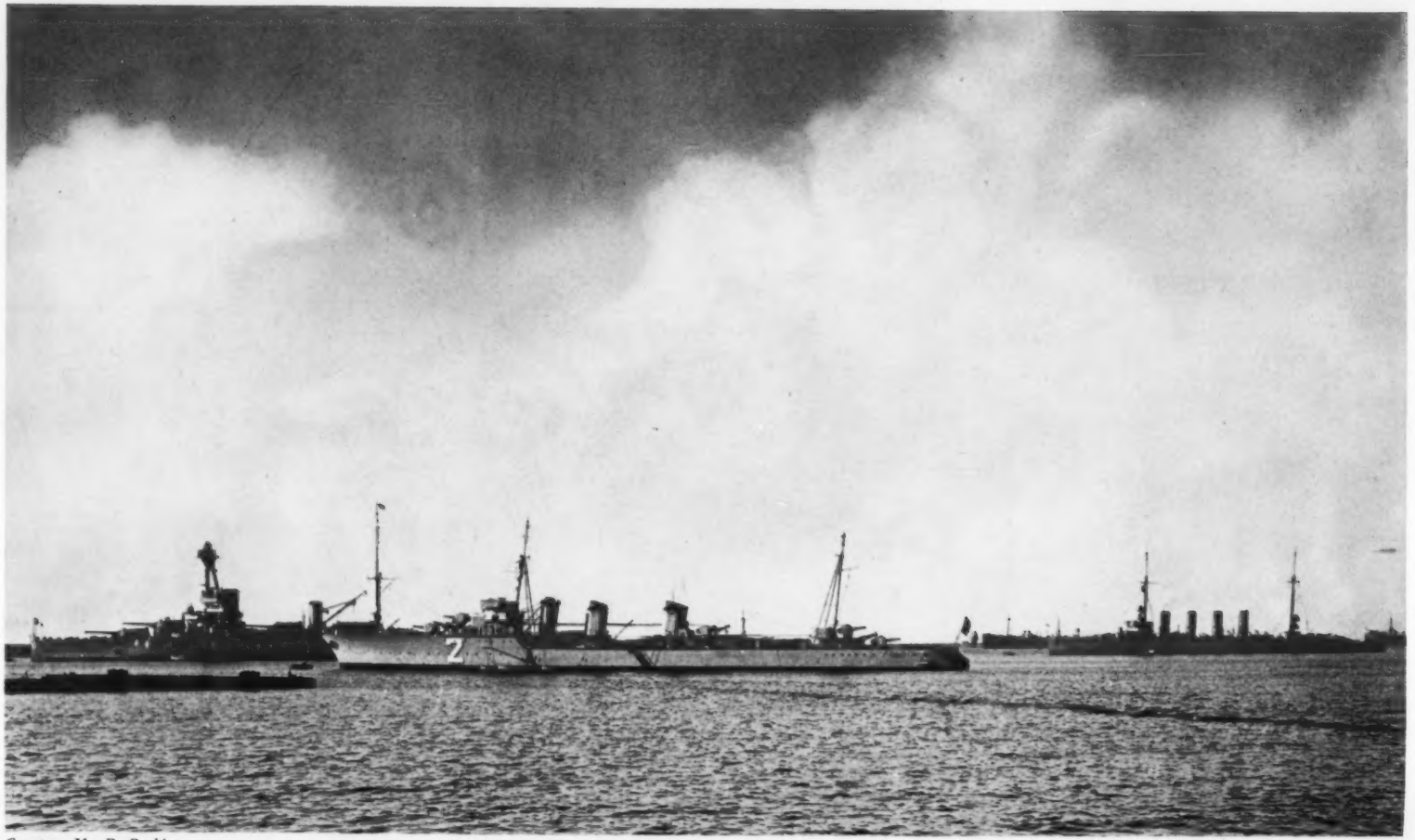
Seaplane flying over H.M.S. *Vindictive* and H.M.S. *Rodne*- ...ground).



Courtesy Mr. R. Perkins

LATEST BRITISH BATTLESHIPS

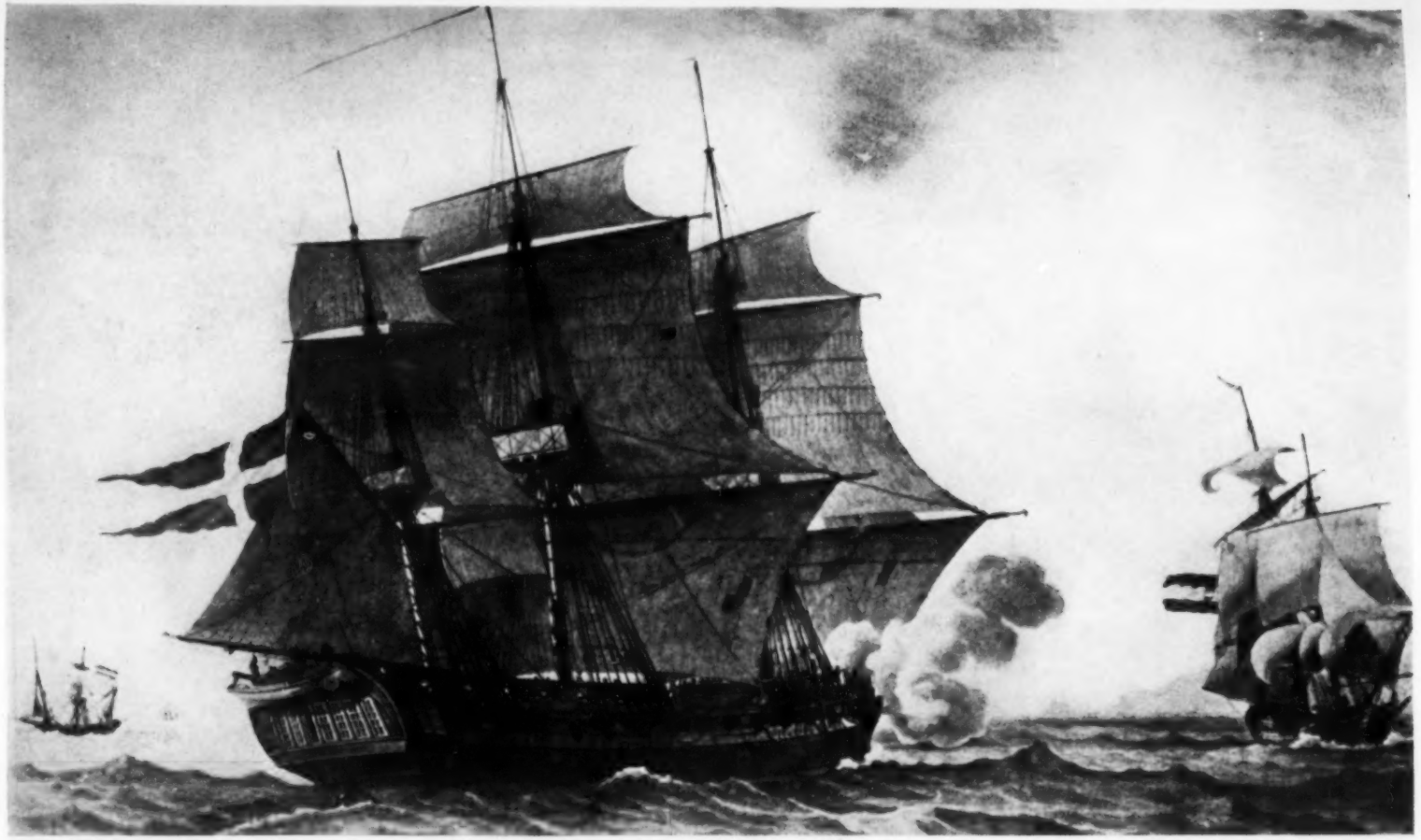
H.M.S. *Nelson* (right) and H.M.S. *Rodney*, completed after the Washington Conference of 1921-22, in accordance with the terms of the conference.



Courtesy Mr. R. Perkins

VESSELS OF THE FRENCH FLEET AT CHERBOURG
Flotilla leader *Chacal* (in foreground) with the flagship *Provence* and cruiser *Mulhouse*.

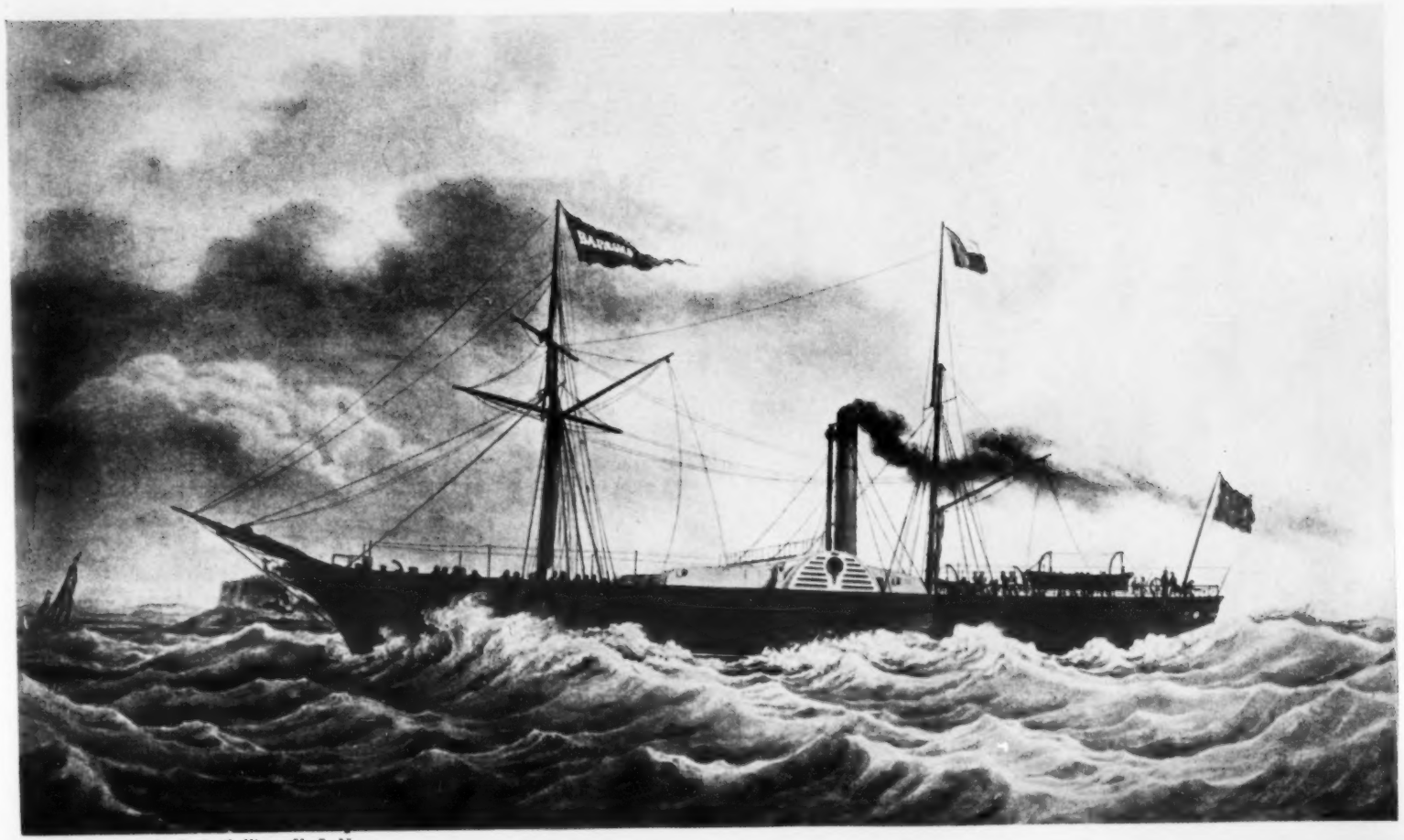
VESSELS OF THE FRENCH FLEET AT CHERBOURG
Flotilla leader *Chacal* (in foreground) with the flagship *Provence* and cruiser *Mulhouse*.



Courtesy Naval War College

MARSEILLAISE SHIP *THETIS* ENGAGING AN AUSTRIAN VESSEL
From a painting by Antoine Roux, Sen., owned by M. H. Valette

UNIV. OF MICH.



Courtesy Commander L. J. Gulliver, U. S. Navy

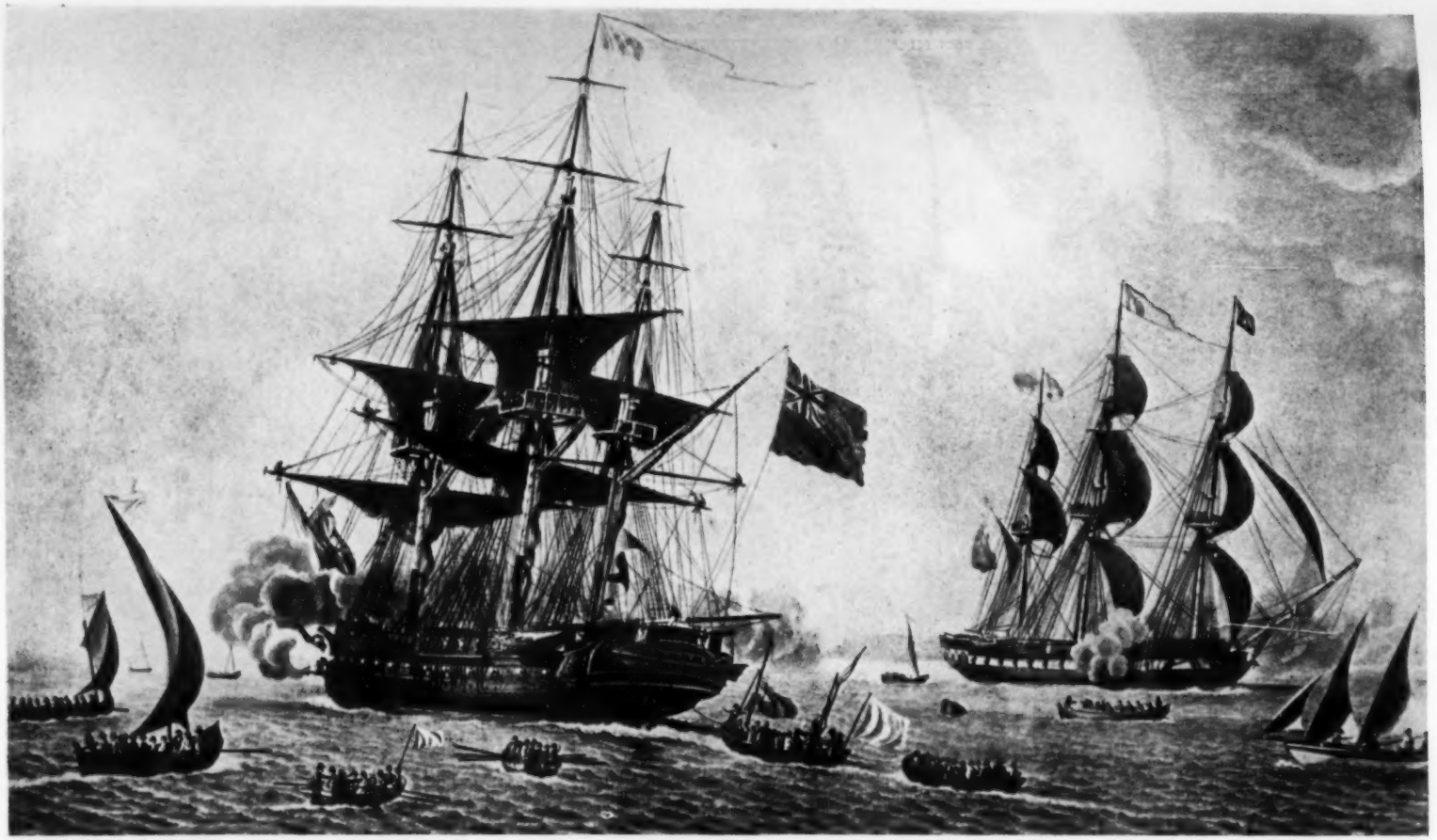
SPANISH STEAMER *BARCINO* PLYING BETWEEN MARSEILLES AND CADIZ

From the painting by François Roux, in a private collection at Marseilles

Courtesy Commander L. J. Gulliver, U. S. Navy

SPANISH STEAMER *BARCINO* PLYING BETWEEN MARSEILLES AND CADIZ

From the painting by François Roux, in a private collection at Marseilles

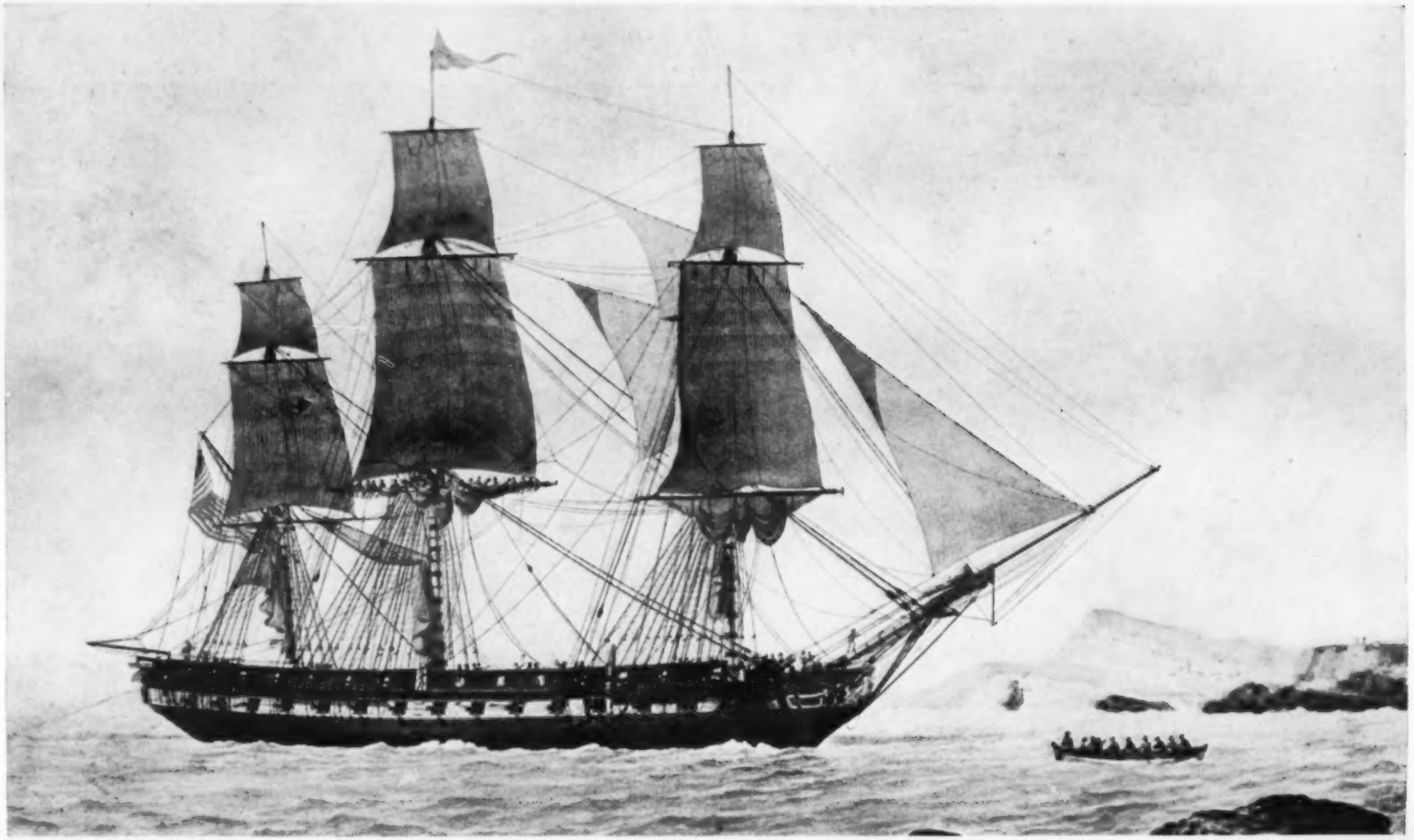


Courtesy Naval War College

ARRIVAL OF THE ENGLISH FLEET AT MARSEILLES, APRIL 16, 1814, AFTER THE ABDICATION OF NAPOLEON

From the painting by Antoine Roux, Sen., 1814, in the Musée d'Archeologie (Château Borély), Marseilles

UNIV. OF MICH.



Courtesy Naval War College

UNITED STATES FRIGATE *CONSTELLATION* (?) BUILT IN 1797

From the painting by Antoine Roux, Sen., 1806, owned by Mr. I. N. Phelps Stokes

Courtesy Naval War College

UNITED STATES FRIGATE *CONSTELLATION* (?) BUILT IN 1797

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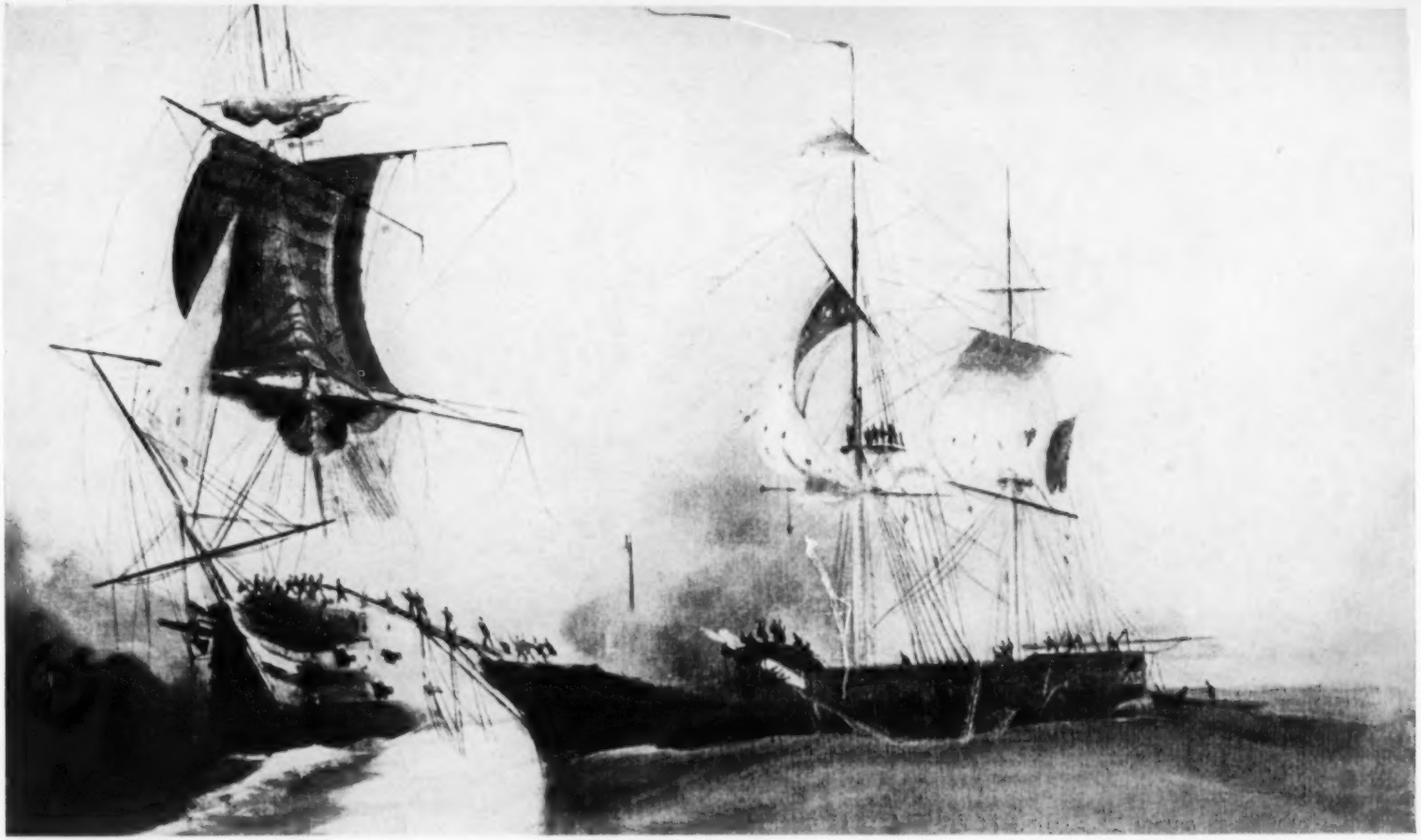
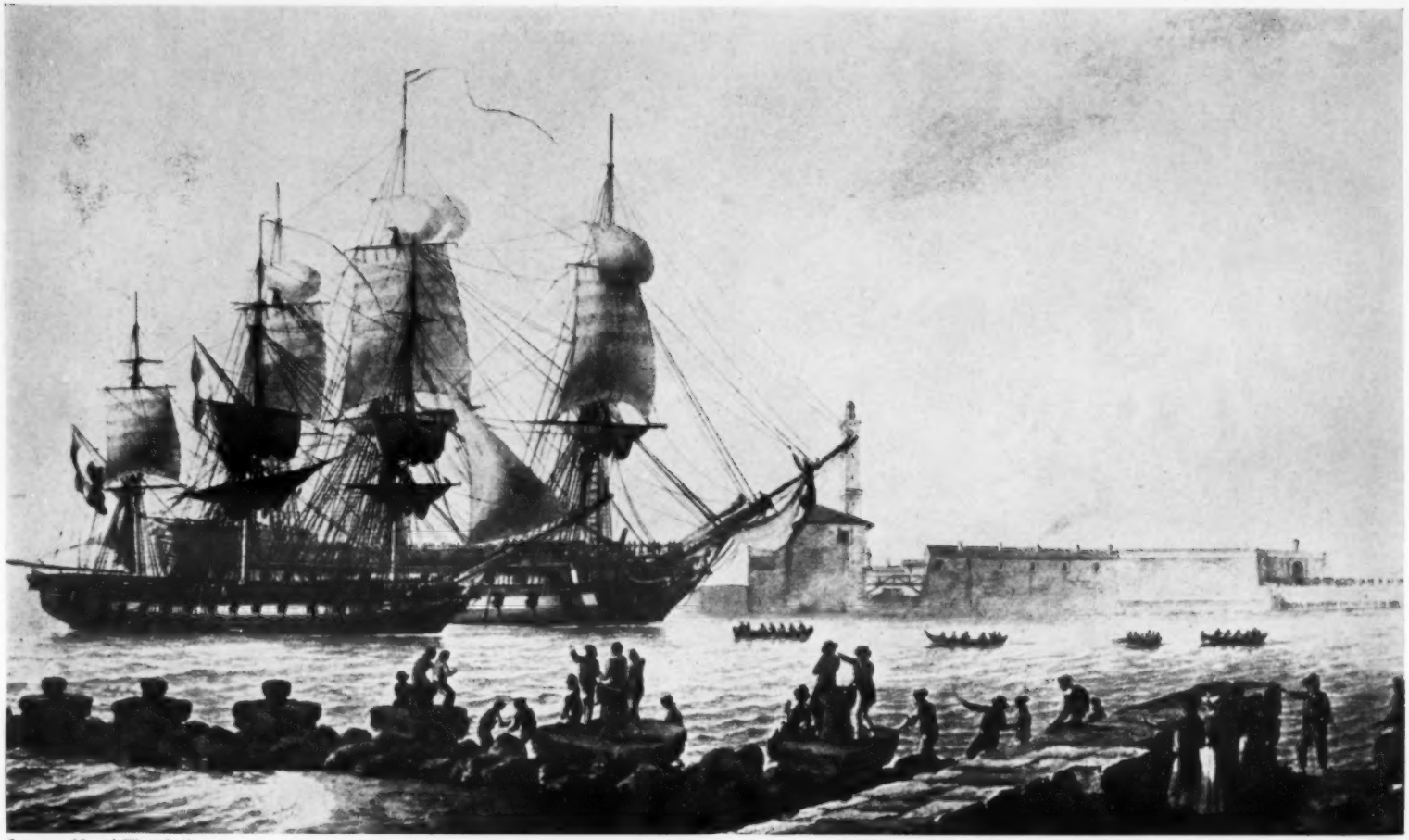


Courtesy Naval War College

UNIDENTIFIED NAVAL COMBAT

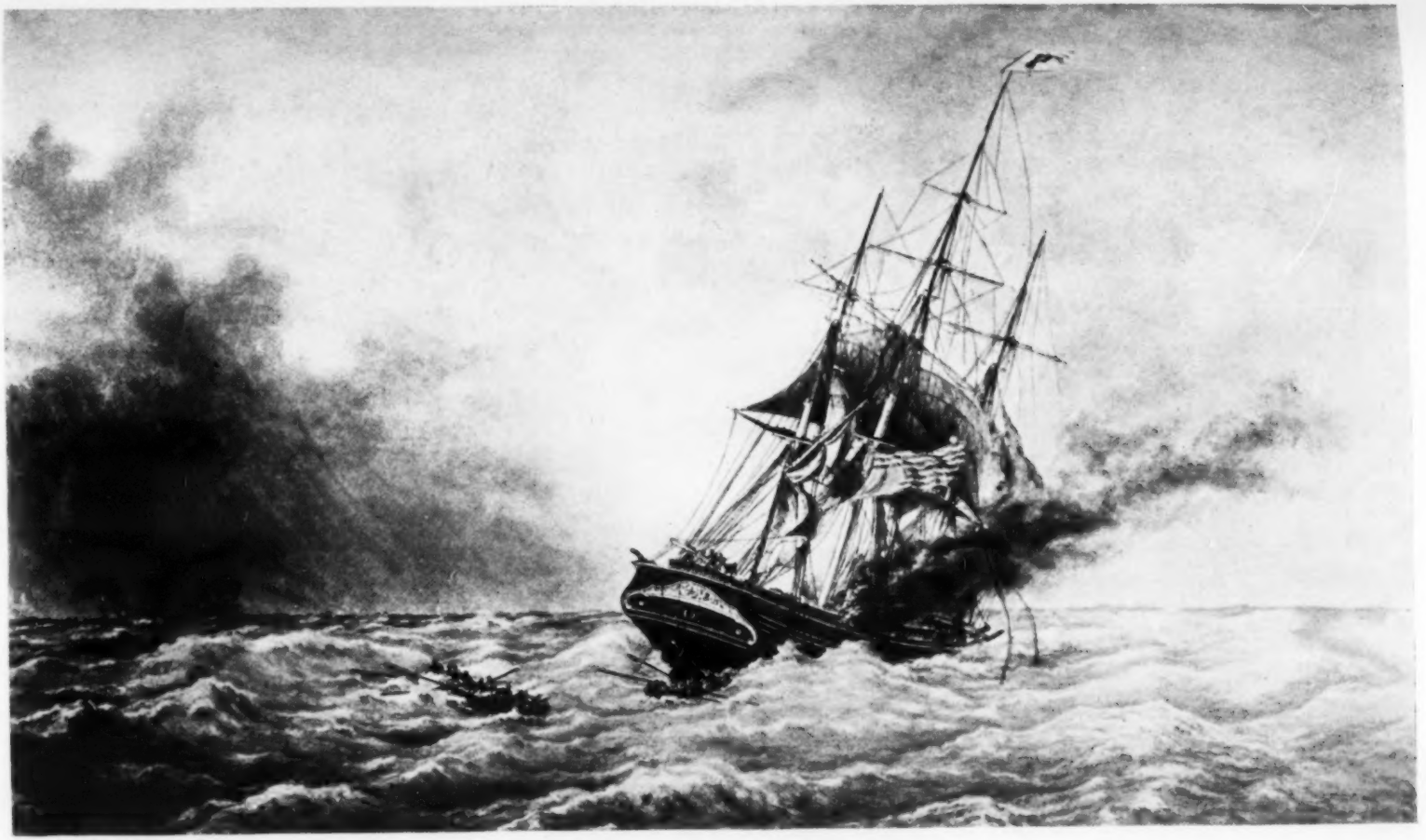
From the painting in oils by Antoine Roux, Sen., owned by M. Augustin Cyprien Fabre



Courtesy Naval War College

FRENCH MAN-OF-WAR *BORÉE* AND FRIGATE *PAULINE* ENTERING SETTE, OCTOBER 26, 1809
From the painting by Antoine Roux, Sen., owned by M. Alfred Fabre

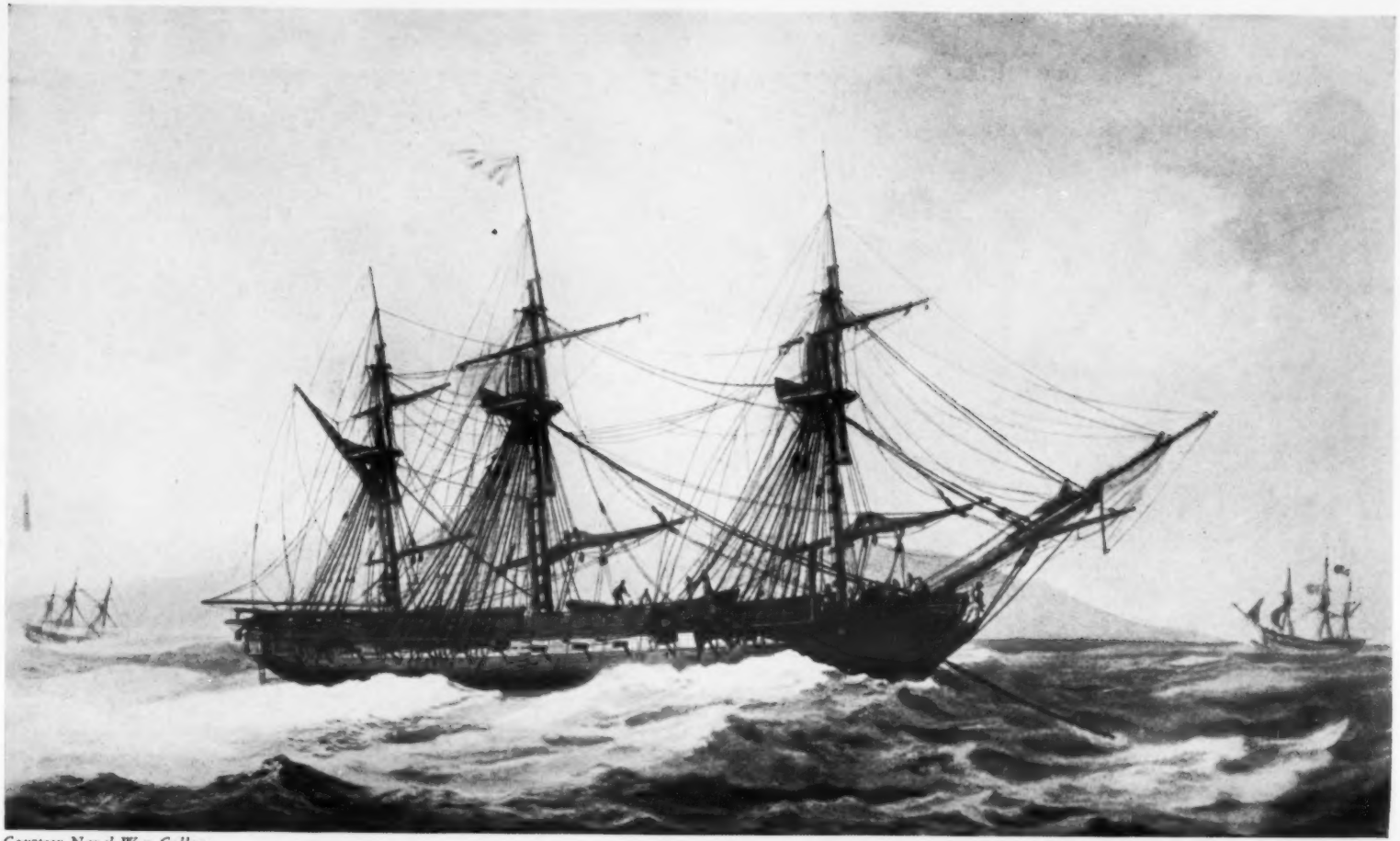
From the painting by Antoine Roux, Sen., owned by M. Alfred Fabre



Courtesy Naval War College

SHIP *POLAND*, OF NEW YORK, BURNING AT SEA

From the painting by François Roux, 1860, in a private collection at Marseilles

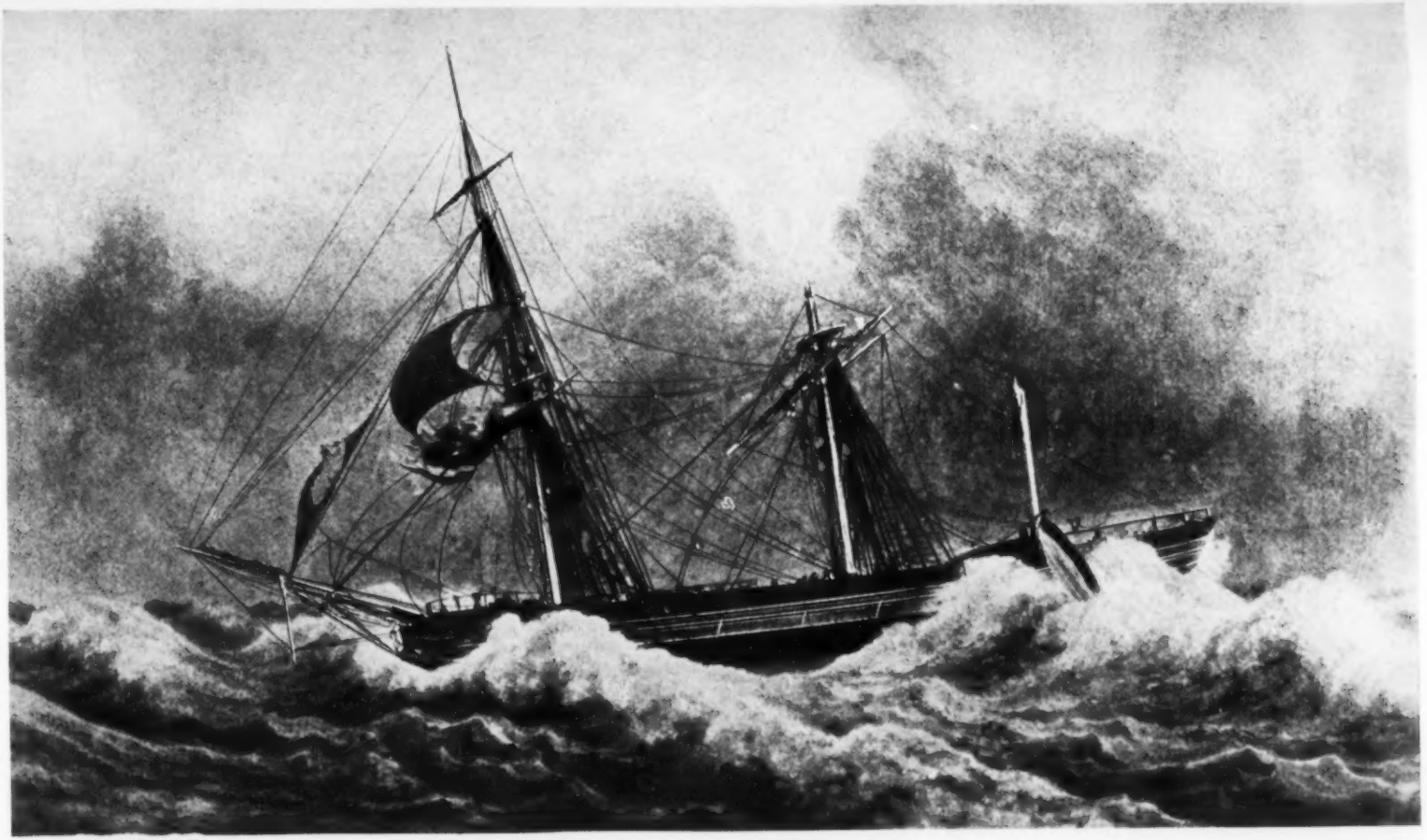


Courtesy Naval War College

UNITED STATES FRIGATE *CONSTELLATION* (?), BUILT IN 1797, RIDING OUT A GALE NEAR GIBRALTAR

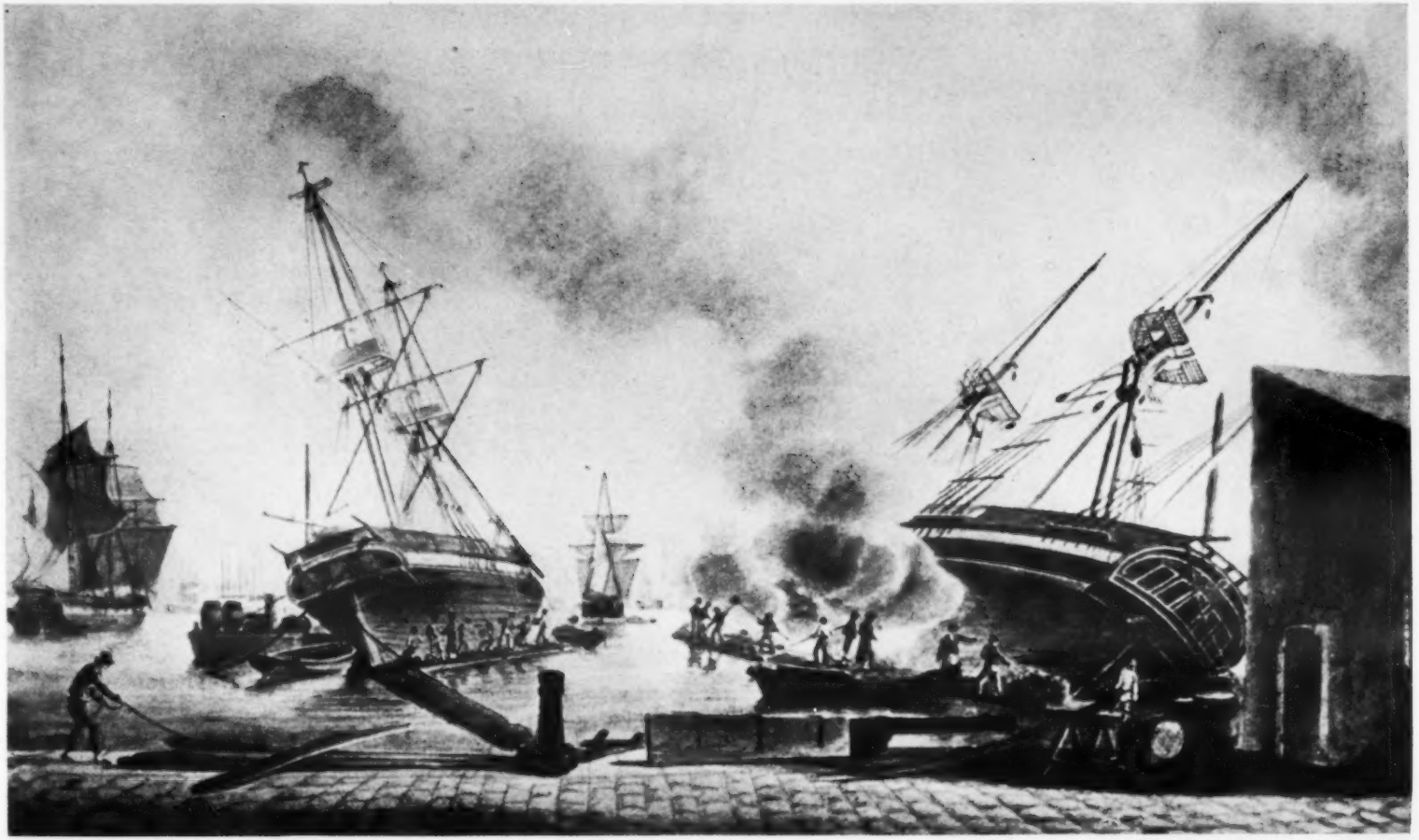
From the painting by Antoine Roux, Sen., 1802, in the Commandant's Office, United States Navy Yard, Charlestown, Massachusetts

UNITED STATES FRIGATE *CONSTELLATION* (?), BUILT IN 1797, RIDING OUT A GALE NEAR GIBRALTAR
From the painting by Antoine Roux, Sen., 1802, in the Commandant's Office, United States Navy Yard, Charlestown, Massachusetts



Courtesy Naval War College

SHIP *CHARLEMAGNE* OF NEW YORK IN A STORM, JANUARY 28, 1838
From the painting by Frederic Roux, 1838, in the Peabody Museum of Salem



Courtesy Commander L. J. Gulliver, U. S. Navy

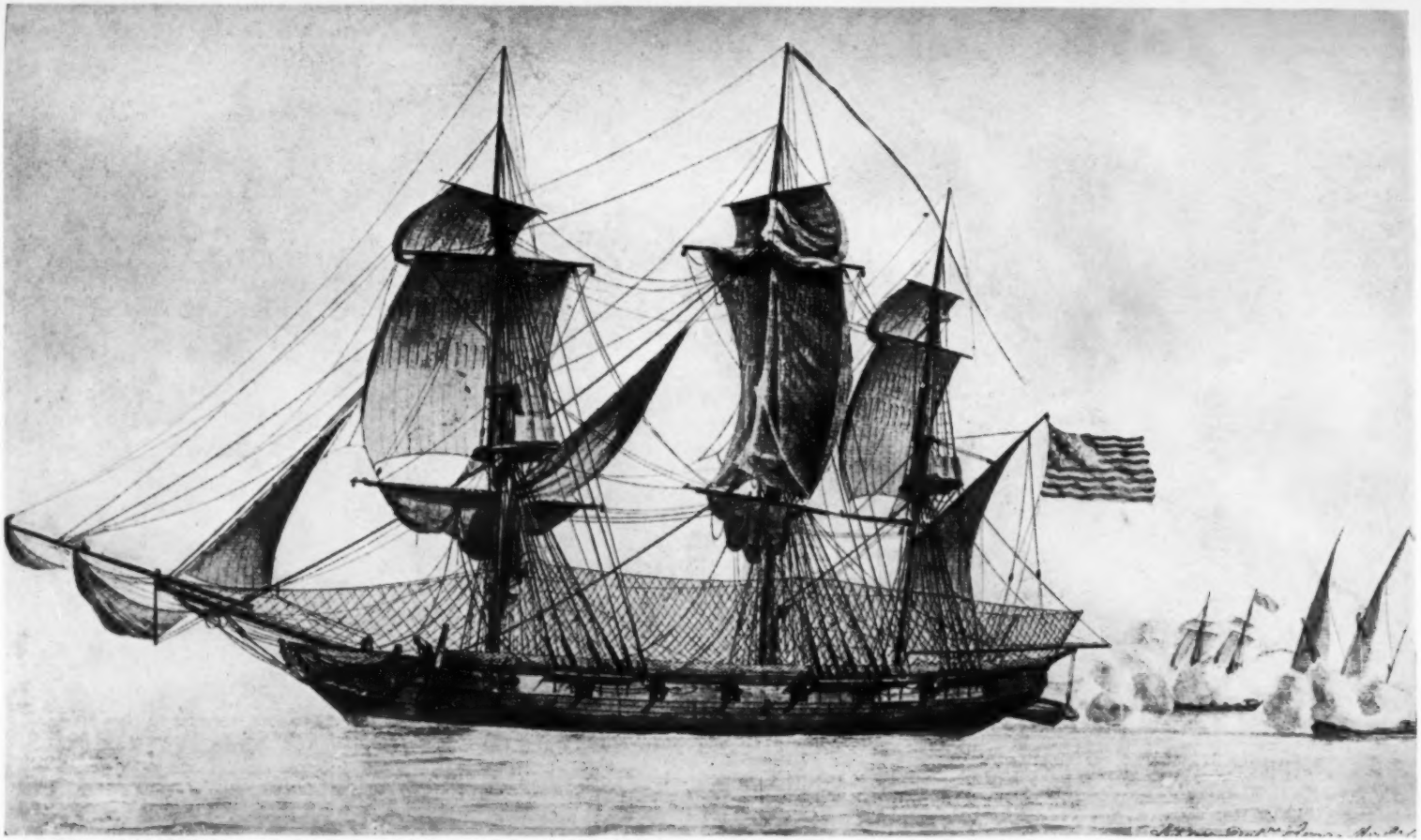
LE BASSIN AU CARENAGE À MARSEILLES

From the painting by Antoine Roux, Sen., in the Musée du Vieux, Marseilles

Courtesy Commander L. J. Gulliver, U. S. Navy

LE BASSIN AU CARENAGE À MARSEILLES

From the painting by Antoine Roux, Sen., in the Musée du Vieux, Marseilles

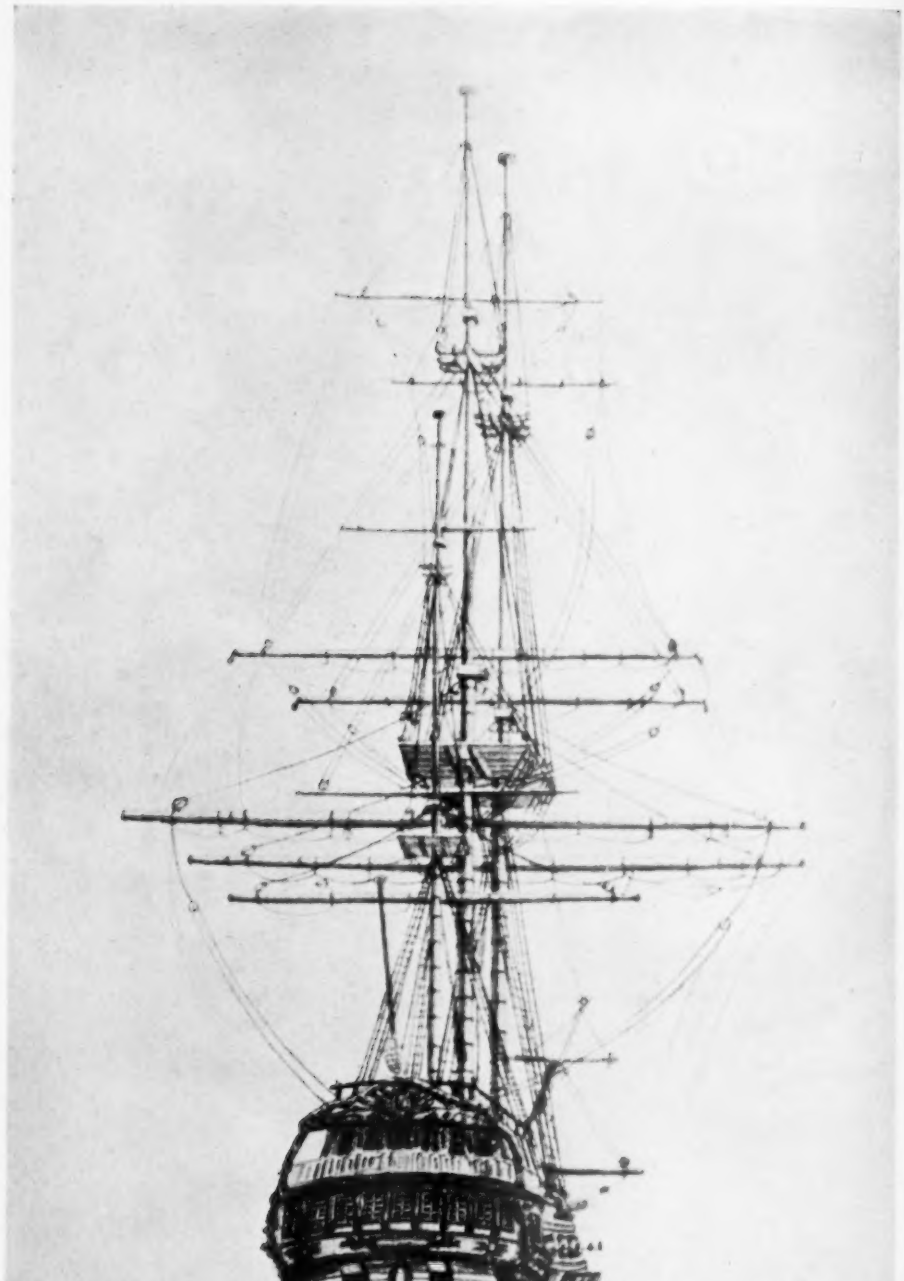


Courtesy Naval War College

SHIP *JASON* OF BOSTON, WITH BOARDING NETTINGS UP

From the painting by Antoine Roux, Sen., 1802, owned by Mrs. Charles G. Weld

UNIV. OF MICH.



Courtesy Commander L. J. Gulliver, U. S. Navy

STUDY OF THE STERN AND SPARS OF A MAN-OF-WAR
From the painting by Antoine Roux, Sen., 1787

Ship Portraits *by* Antoine Roux *and* Sons

By COMMANDER L. J. GULLIVER, *U. S. Navy*

WHEN I mentioned to a brother officer, recently, that I had been looking at ship pictures by Antoine Roux and his three artist sons, he said: "You could rig a ship from a Roux picture."

And he might have added that you almost could build a ship from a picture by one of the Roux family, and man her, too, with a crew dressed in the style and color of garb and uniforms worn by sailors, masters, mates, and captains of the era in which the Roux lived and worked.

Ship pictures by Antoine Roux and his sons Antoine, Jr., Frederic, and Francois, are something more than works of art, of interest only to those who go to ship museums and art galleries. They are records, both precise and beautiful, in water colors, of frigates and bombships, zebecs, corvettes and polacres, pinques, privateers, brigs, schooners, catalan barks, clipper ships, whalers, hermaphrodite brigs, packet ships, and men-of-war, of every maritime nation that sailed the seas from 1760 to 1870. Fleets in naval combat, frigates at anchor, men-of-war riding out gales, clipper ships on fire at sea, brigs storm tossed on the ocean, barks heeled over for underwater repairs—no activity of vessels or seamen but was recorded by the brushes of one of the Roux.

Who were the Roux and how came to pass such a remarkable family—the father a portrait painter of ships, and three sons who in some ways equalled and even surpassed the master himself?

One hundred and thirty years ago shipmasters and owners gratified the natural pride they felt in their vessels by having a likeness of their ships reproduced on canvas—in water colors—photography being then unequal to what was wanted. The best artists for this class of work were found on the water fronts of Marseilles, Genoa, Leghorn, and Havre, and in the Chinese treaty ports were workmen with brushes and color who turned out reproductions of a ship that, while exact, were lifeless—like the Chinese tailor who makes your suit to the exact measurements of your American clothes, and fails to give it a bit of style.

In Marseilles lived the best of these ship picture-makers and of these Antoine Roux, born in 1765, was the originator of ship portraits in water colors.

In his hydrographer's shop on the Marseilles quay, where the bowsprits of the world's shipping protruded almost into the curtained bedrooms of the water front dwellers, Antoine Roux painted ships and seamen at the order of merchant captains, sailors, admirals, and *capitaines de frégate*, who came to buy bunting, charts, marine glasses, octants, logs, and ship's clocks, a business descended to him from the older Roux. In the shop of Antoine Roux there was no studio; he had been advantaged by no artist instruction; he had been taught no principle of perspective or drawing. Antoine Roux's career as a water-colorist in ship portraits began with the making of sketches—always of ships—ships underway, ships at anchor, ships in action—sketches so exact in detail, so faithful in delineation, so true to national characteristics, that officers and men alike besieged him to take the next step, to color his sketches. Thus was born the artist, Antoine Roux, who, loving the work of making ship portraits, still continued to sell to his customers compasses and canvas.

Sailors liked the pictures of Antoine Roux for the same reason that ship masters and owners bought them, because they were real ships; they, too, probably said that they could rig a ship from one of Antoine's pictures—pictures that always carried across the bottom a black band, the setting for white letters depicting the ship's name, her home port, and the name of master and of owner.

The pictures of Antoine Roux are valued

today many times above the poor price that the humble hydrographer received for them. Those who seek exactitude of detail in the ships of a century and a half ago, and of the color and style of dress worn by the peasant, soldier, and sailor of those days, find in Antoine Roux's pictures not only the scenes but the people and the customs reproduced in a way that no mere words can convey.

Those who seek more than word pictures of the naval combats of frigate against frigate, of fleet actions, of sail powered men-of-war, of the way that seamen maneuvered in the progress of battle, have studied with pleasure and profit the naval pictures of the great Roux.

Antoine Roux's ships are alive; their crews are about their appointed tasks. In his picture showing the *Constellation* riding out a gale one can feel the gallant ship straining in every rib and plank; can almost hear the orders of her officers roared out above the whistling of the gale through the rigging, and the rushing sailors hauling strongly at the gear aloft to send down light yards and upper masts.

Examine the picture depicting the arrival of the English fleet at Marseilles after the abdication of Napoleon. Here is more than a true portrait of English men-of-war just anchoring in a foreign port; here is an air of triumph, of excitement, almost of tense gaiety.

The pictures by Antoine Roux, like the work of every artist, are labors of love—creations from his hand on canvas, above and beyond the work of selling charts and chronometers—work that he carried on faithfully, just as he faithfully gave his heart to the pictures of ships that he must have loved. Antoine Roux made many pictures, perhaps hundreds, and from his brush we can now see, as he saw, the bourgois in frock coat, the Marseillaise fisherman in poor woolen serge, Greek and Catalan sailors in national costumes, peasants, women fishmongers in lace bows.

If Antoine Roux were not remembered for his own depictions of ships and sailors, his name would survive for the marine portraits from the brushes of his three sons, Antoine, Jr. (1799-1872), Frederic (1805-1870), and Francois (1810-1881).

Antoine, Jr., made many ship portraits which he signed Antoine Roux, but these will not be mistaken for those of his father—the master.

Frederic, the second son, early showed most remarkable aptitude for doing ship pictures. Unlike his father and older brother, Frederic went to Paris to study art and later became a brilliant water-colorist of marine pictures. To him, at length, came the call of the blood and in Havre he established an hydrographer's shop, like his father and grandfather before him, and became admired and sought after by every American shipmaster who visited French seaports.

Francois Roux, compared with his brothers, had the longest and most brilliant career as a painter of ship portraits. He, like his father, stayed in Marseilles, sold compasses and charts, and made pictures. In this he acquired amazing skill; no themes were too large for his brush, no subject too difficult to exhaust his painter patience.

It has been written of Francois Roux:

> From the point of view of truth and precision, exceptional interest, science of ships as if he were a shipbuilder or a sailor; understanding of rigging and ship handling; the types reproduced by Francois Roux are irreproachable for form correctness of appearance, trim, lifelike naturalness of movement.

Vice Admiral Paris, French Navy, said of Francois:

> He had perfect exactitude and finish—when his ship portraits were photographed the results looked as if taken direct from the ship itself. His pictures brought out the peculiarities of build and rigging of each epoch, and his details enlightened, without injuring the whole. One feels the remarkable modeling of his ships; his ship's boats, which despite smallness, would serve the boat builder in making his models. His rigging is absolutely correct. Francois Roux's pictures will preserve for all posterity the physiognomy of the ships of our time. The French Navy has lost an artist who represented it with accuracy and elegance.

Francois Roux's ships are in the Marine Museum of the Louvre—sixty-three water colors, representing men-of-war from 1810 to 1880—each a true portrait made from sketches from the ship herself and on a scale to permit prized details.

His pictures, as naval history, have the authenticity of parchment documents.

The College, *the* Technical School *and the* Naval Academy

By COMMANDER H. E. ROSSELL *(C.C.), U. S. Navy*
Head of Department of Mathematics, U. S. Naval Academy

IT IS the purpose of this paper to make a critical study of the entrance requirements and curricula of a number of typical, first-rate institutions of higher education in the hope that the study will either confirm the wisdom of the present academic policies of the Naval Academy or indicate desirable changes.

ENTRANCE REQUIREMENTS

Entrance requirements of the institutions under consideration are tabulated below.

TABLE 1

School and Lower Age Limit	*Admits by*	*Total Min. Credits*	*Required Units*	*Elective Units*	*Required Subjects*	*Remarks*
Massachusetts Institute of Technology 17 years	Exam.	15	13	2	Math. 4; English 3; Physics 1; Languages 3; History 1; Chemistry 1.	For electives record of passing grades is accepted in lieu of exams.
Worcester Polytechnic Institute. 17 years.	Exam. or certificate.	14½	10½	4	Math. 3½; English 3; Physics or Chemistry 1; Languages 2; History 1.	
Stevens Institute of Technology 17 years.	Exam. or certificate and substantiating Exam. in Math.	14½	12	2½	Math. 4; English 3; Physics 1; Languages 2; History 1; Chemistry 1.	
Cornell Arts and Sciences 16 years	Exam. or certificate.	15	11½ or 12	3 or 3½	Arts Course Math. 2½; English 3; Languages 5; History 1. Science Course Math. 4; English 3; Languages 4; History 1.	
Cornell Engineering. 16 years.	Exam. or certificate.	15	11 or 12	3 or 4	Math. 4; English 3; Languages 3 or 4; History 1.	

TABLE 1 (continued)

School and Lower Age Limit	*Admits by*	*Total Min. Credits*	*Required Units*	*Elective Units*	*Required Subjects*	*Remarks*
U. S. Naval Academy. 16 years.	Exam. or certificate and substantiating Exam.	15	9	6	Math. 3; English 3; Physics 1; History 1; 1 from group of sciences, mathematical subjects, and languages.	
University of Michigan—College of Literature, Sciences and the Arts. 16 years.	Exam. or certificate.	15	8	7	Math. 2; English 3; Ancient or Modern Languages 2; Science 1.	
University of Virginia—College of Arts and Sciences. 16 years.	Exam. or certificate.	15	6½	8½	Math. 2½; English 3; History 1.	
Stanford University Arts and Sciences. No age limit.	Exam. or certificate. (aptitude test is given.)	15	2	13	English 2.	Prospective applicants are advised to acquire 4 units in English, 3 or 4 in one or more modern languages, 1 in history and 3 in science.
Stanford University Engineering. No age limit.	Engineering course at Stanford consists of 2 years of graduate work. Bachelor's degree or the equivalent is required for admittance to the course.					

NOTES

Cornell Catalogue—Remarks relative to Engineering Courses: "Since the work in the regular four years' course in this college is largely technical, it is desirable that the student devote more time to his course in order to broaden his training. This may be done by devoting five or six years."

W.P.I. Catalogue—"A broad training including the ancient languages and history is of advantage to any student who undertakes the work of the Institute."

M.I.T. Catalogue—"The student intending to enter the Institute should bear in mind that the broader his intellectual training and the more extensive his general acquirements, the greater will be the advantage he may expect to gain."

CONCLUSIONS AS TO ADMISSION REQUIREMENTS

The substantiating examinations, upon the results of which about 50 per cent of the candidates presenting certificates for admission to the Naval Academy are rejected, make the entrance requirements to the Academy more difficult than those of any of the representative institutions listed above except Massachusetts Institute of Technology, Stevens Institue of Technology, and the Stanford School of Engineering. The character of the required subjects for the Academy represents roughly an average of that for technical schools and that for colleges of arts and sciences. The Academy requires less mathematics than the former and more than the latter. The Academy does not require a modern language as do most of the other institutions.

On the whole it appears that incoming midshipmen are at least as well prepared

academically as the rank and file of students starting in as freshmen at colleges or at technical schools.

Physical Condition

A rigid physical examination is a special requirement for admission to the Naval Academy. As men in good health are known to be more alert mentally than ones laboring under physical handicaps, the incoming fourth classmen should be potentially better scholars than are average college freshmen.

Maturity

The lower age limit for admission to the Naval Academy is the same as is in effect at most of the colleges and technical schools under consideration. There is no upper age limit at the latter institutions, however, whereas the upper limit for the Naval Academy is twenty years. It seems probable, therefore, that the average college freshman is slightly more mature than the average fourth-class midshipman but not markedly so.

Duration of Course

All of the institutions under consideration except the Naval Academy and the Stanford School of Engineering offer courses of four academic years leading to a bachelor's degree or to an engineering degree. The latter school accepts only college graduates and its course may be considered in conjunction with a college course, the combination consisting of six academic years of work. In addition to its regular four-year engineering courses Cornell offers five- and six-year courses leading to engineering degrees. The Naval Academy course comprises four academic years and four summers of three months each. For purposes of comparison it may be considered as made up of five academic years of work if it be assumed that full use is made of the summers.

Character of Course at College of Arts and Sciences

In general, to qualify for a bachelor's degree a student at a college of arts and sciences must have successfully completed 120 semester-hours of academic work, partly in required subjects and partly in elective ones. A semester-hour is defined as one hour in class room and two hours of preparation weekly throughout half of the academic year. Three hours of laboratory work ordinarily count as one hour of recitation or of attendance at lecture.

Most of the colleges specify a large portion of the student's work for the first two years of the course and allow greater latitude to the individual in selecting his subjects during the remaining two years. It is required in general, however, that a student shall devote his major attention to one group of studies during the last two years of his course.

It is the intention, apparently, to give the student enough latitude in selecting studies to permit him to follow lines dictated by his interests and by his abilities but to exercise over him sufficient supervision to insure that no matter what his major study may be he will have acquired upon graduation a well-rounded education.

Although colleges are by no means standardized as to their requirements and curricula, the College of Arts and Sciences of Cornell University is fairly typical; and the course offered by that institution is described in some detail in order to present more concrete information than is contained in the above remarks.

Prior to graduation, a student at Cornell must complete six hours in each of the first two groups listed below and six hours in each of five of the remaining six groups:

1. English and public speaking
2. Foreign languages
3. History
4. Astronomy, chemistry, and physics
5. Biology and geology
6. Philosophy and psychology, including educational psychology
7. Economics and government
8. Mathematics

Before the end of the sophomore year each student is required to complete, in addition to the first two groups, at least eighteen of the required number of hours in five of the remaining six groups. Of these hours, the student is required to take at least twelve, and advised to take more, in his freshman year.

The student is permitted to select with faculty advice the remainder of the sixty hours comprising his first two years' work.

The subjects from which choice may be made cover an extremely wide field and include modern and ancient languages, mathe-

matics, history, natural sciences, music, and many other studies.

During the junior and senior years, the student must complete at least twenty hours of work in one of the following groups:

1. The classics
2. Botany
3. Chemistry
4. Economics
5. English and public speaking
6. French and Italian
7. Geology and physical geography
8. German
9. History and government
10. Mathematics
11. Philosophy and education
12. Philosophy and psychology
13. Physics
14. Animal biology
15. Psychology and education
16. Spanish and Italian

The remaining forty hours of work of the last two years are selected by the students with faculty advice from a wide list of subjects.

Character of Course at Technical School

In general, technical schools (except graduate schools) give practically the same course to all freshmen, the students starting to specialize at the beginning of the sophomore year. When the course to be followed has been designated by the student he is permitted very little discretion as to selection of subjects even during the last two years. For example, at Massachusetts Institute of Technology mechanical-engineering students are permitted to elect only two hours of professional study and eight hours of general study during the four years. The general studies may be selected from a wide range of subjects including languages, English, social, political, and business subjects, history, and music.

The amount of time devoted to cultural studies at four-year engineering schools is woefully small. For most courses at M.I.T. it is only fourteen hours, six of which are on English and history and eight of which are on general studies as listed above. Within recent years M.I.T. has established a new and interesting course entitled general engineering. In addition to the usual fourteen hours of cultural study, it contains six hours of English and history, six hours of economics, and thirty hours of general or professional study to be elected by the student.

The mechanical engineering course at Worcester Polytechnic Institute contains the following cultural studies:

English, six hours
Modern languages, eleven hours
Argument, one and one-half hours
Economics, three hours
Political science, three hours
Business law, one hour
Total, twenty-five and one-half hours

The mechanical engineering course at Cornell requires only five hours of cultural study, two in English, and three in economics; but students are permitted to elect six additional hours of such study.

The Stevens Institute of Technology differs markedly from the usual type of engineering school. It offers only one course which is of four years and which is designed to fit the students to enter any field of engineering. At this institution unusual stress is laid on general cultural study of which twenty-eight hours are required, and the basic principles of various engineering branches are dealt with rather than the advanced practice in any single branch.

In addition to the regular academic work students at most engineering schools are required to attend one or more summer sessions which are devoted to practical shop or field work.

Engineering students are required to undertake about eighteen hours of work weekly as against fifteen for college students.

Character of Course at the Naval Academy

The academic year at the Naval Academy is about two weeks longer than that at most institutions of higher education, the reason for this condition being that fewer and shorter vacations are granted at the Academy. Midshipmen are required to take sixteen to seventeen hours of work weekly, a standard below that of technical schools and above that of colleges. The time for preparation for each hour of recitation is nominally less at the Academy. Actually the regularity required of midshipmen in observing study periods more than offsets their brevity.

The Naval Academy four-year course maybe classified as shown in Table 2.

TABLE 2

Character of Study	*Subject*	*Semester hours*	*Department having cognizance*	*Remarks*
Cultural	Eng., Comp. Liter., Public Speaking.	6	English	Also evening public-speaking sessions.
	History, Naval	3	"	
	U. S. History	3	"	
	Mod. European History	2	"	Also evening lectures.
	Mod. Languages	14	Mod. Languages	
	Hygiene	0	Hygiene	10 Friday evening periods.
	Leadership	1½	Seamanship and Flight Tactics	
	International Law			
Total cultural		29½		
Fundamental Sciences	Mathematics	22	Mathematics	
	Mechanics	5	"	
	Chemistry	4	Electrical Eng. and Physics	
	Physics	8	"	
	Descriptive Geom. and Mechanical Drawing	4	Engineering and Aëronautics	Strictly speaking the drawing is not a science; but as it is taught with the descriptive geometry the two subjects are classified together.
Total fundamental sciences		43		
Professional non-engineering,	Navigation	10	Navigation	
	Seamanship	7½	S. and F.T.	
	Flight tactics			
	Regulations			
	Communications			
	Signals			
	Military Law			
	Aviation history			
	Ordnance	9	Ordnance and Gunnery	
	Gunnery			
	Ballistics			
	Fire Control			
	Bombing			
Total professional non-engineering.		26½		
Professional engineering	Mechanical Drawing	3	E. and A.	
	Mechanisms	3	"	
	Engineering Materials and Processes.			
	Boilers, Recip. Engines, Auxiliaries, Naval Construction, Aircraft Construction.	7	"	A very brief course in aërodynamics is included under this heading.
	Thermo-dynamics, Turbines, Internal-Combustion and Aviation Engines	6	"	
	Electricity, D.C.	6	E.E. and P.	
	Electricity, A.C.	6	"	
	Radio			
Total professional engineering.		31		

Summary		
Cultural studies	29½	hours plus evening sessions equivalent to 1½ hours.
Fundamental sciences	43	hours.
Professional non-engineering	26½	hours.
Professional engineering	31	hours.
	130	hours.

In addition to following the above curriculum, midshipmen are required to take part in five practical drills or exercises weekly throughout each academic year. Moreover four summers of three months each are devoted to practical work, one summer being spent at the Academy and the remaining three on cruises on seagoing vessels. The cruises may be considered as major laboratory sessions. Aside from the great professional benefits derived from them, they enable the midshipmen to acquire knowledge of and experience in human relations. Such an opportunity of observing at close range the activities, habits, and mental attitude of the class of "labor" which the midshipmen are to control in later life is of inestimable value. In the writer's opinion if colleges and technical schools would require their students to use the summer periods in corresponding endeavors, the products of those institutions would be broader individuals better fitted to meet the problems of life.

Trends in Higher Education in Last Twenty-Five Years

When the writer was considering going to college about twenty-five years ago, he had acquired an excellent secondary school education including mathematics through trigonometry; English composition and literature; physics; physiology; chemistry; three years of French; one year of Latin; and Babylonian, Greek, Roman, English, and U. S. history. He was shocked to discover, therefore, that he could not get into a first-rate college of arts and sciences without condition because of deficiency in the classics. Today the entrance requirements are far different. Insistence on the classics has been dropped and greater recognition has been given to the sciences.

The curricula of colleges have undergone changes, also. The study of classics is no longer required and much greater attention is being given to economics and to social and natural sciences. The colleges have recognized the demands of the business world by injecting into their curricula courses in commercial subjects. In brief the tendency has been to get down a little nearer to cases.

During the same period the technical schools have seen great developments in the scope of the engineering professions. Such branches as radio and aëronautics have grown from practically nothing to enormous proportions. The motor car and the internal-combusion engine have demanded a place in the sun. Scientific management has blossomed into a separate engineering profession. Sanitation, city planning, road building, and many other major problems have placed additional burdens upon the technical schools. In the face of all of these technical developments, attention has been called to the desirability of broadening the education of the students by giving them instruction in economics, politics and government, history, literature, argumentation and debate, finance, business law, and what not.

Urged on the one hand to increase the scope of technical instruction and on the other to broaden the courses by the addition of general and cultural studies, the schools find themselves in a dilemma.

As the earlier of the two pressures was that calling for more technical work, about ten or fifteen years ago the schools embarked on a program of extension and multiplication of purely engineering courses.

It has been only within recent years that the demand has become insistent from industry and particularly from engineers that broader gauge men be turned out by the technical schools. The engineers have become weary of seeing the lion's share of responsible administrative positions in industry go to lawyers, business men, financiers, and salesmen, with most of the technical men relegated to the drawing boards. Engineers are beginning to realize that this state of affairs is due not to prejudice against their profession but rather to their own narrowness. Many of them lay this deficiency at the doors of the technical schools.

These schools, finding themselves decidedly on the defensive, are reacting from the idea of cramming into the heads of students a mass of highly specialized and exclusively

material facts and figures and of leaving to their own initiative the acquisition of knowledge of life and of events.

The following quotation from the inaugural address of Dr. H. N. Davis, the newly installed president of Stevens Institute of Technology, is indicative of the modern trend of thought, though educators are by no means unanimous in advocating, as does Dr. Davis, the unified technical course rather than a multiplicity of courses:

> Why waste time in an engineering school learning details, descriptions of processes and of machines, tricks of technique of hand or brain, or even miscellaneous facts, all of which, in so far as one wants them at all, can be learned far more effectively on the job? Why not devote one's time in the school in learning what one may never have another chance to learn, namely fundamental principles, and how to think? And always remember that ignorance, plus willingness to learn, plus ability to learn, is a far better basis on which to establish appropriate and satisfactory human relationships with one's own organization, and with the world in general, than is "knowing a lot of things, even if all of them are so."
>
> My conception of the educational opportunity which the undergraduate engineering schools of today would do well to offer their students must be, by now, fairly clear to you. There will not be a multiplicity of more or less specialized undergraduate curricula, each designed to train for some one variety of engineering career. There will be one curriculum. And in this curriculum the emphasis will be placed on the basic disciplines that underlie all engineering careers; there will be plenty of mathematics, physics, and chemistry; there will be mechanics in all its branches, including the deplorably few fundamental principles that are yet known as to the nature and serviceableness of the materials of engineering; stress will be laid on thermodynamics and in particular on the two laws of thermodynamics and on how to use them as a vital part of one's thinking; there will be electro-dynamics, with emphasis on the fundamental principles of both direct and alternating current phenomena; at least a foundation will be laid in hydro and aërodynamics; and there will be thorough training in the various arts of mensuration, and in the still greater art of feeling instinctively the appropriate degree of skepticism as to the results. Many useful facts will be automatically stored away in the student's mind if his teachers will merely adhere strictly to the practice of basing every problem or examination question on real data. But there will be a great dearth of survey courses designed primarily to impart facts. Throughout, the method of attack, rather than the answer, would be the significant thing.
>
> This curriculum will also emphasize the non-technical, purely human side of an engineer's life, by offering an appropriate amount of history and literature, of economics and government, of psychology, of philosophy and ethics, and even of music and art, and by stressing the economic and human sides of engineering itself in every available way.
>
> And finally, this curriculum will be such as to develop in each individual student, to at least an acceptable degree, the various arts of self-expression and of communication, including not only the sketching pencil and the drawing pen, without which so many engineers are hopelessly inarticulate, but particularly the written and the spoken word.

To sum up, the technical schools are now going through a transitional period with a decided trend toward liberalization. The goal toward which they are headed seems to be a four-year course consisting largely of general cultural studies and in which stress is laid on fundamentals rather than on advanced technique. Probably the geniuses as well as the extremely unimaginative students will find need for a year or two of post-graduate technical study to fit the former to follow in the footsteps of the Steinmetzes, the Einsteins, and the Edisons, and the latter to assume the burdens of routine computation and detail design.

Now what has been happening at the Naval Academy during this last twenty-five years of material development? Have we kept pace with the advance in technique? If so has this been accomplished by sacrificing general and cultural study? Are the graduates better informed technically or not and are they wiser and better balanced?

The answers lie in the fact that progress both in improvement of the quality and scope of technical instruction and in liberalization of the course as a whole has been such as to justify great pride on the part of those in charge of directing the policies of the Academy during this period.

Twenty-five years ago the instruction in navigation, seamanship, languages, and mathematics was excellent as to both quality and scope. The same cannot be said truthfully, however, for most of the rest of the course. We taught the construction and details of steam boilers, engines, and auxiliaries, but not thermodynamics. In other words, we taught the details of marine engineering but not the science upon which they were based. We taught the shape, size, and nomenclature of parts of guns and torpedoes but gave little attention to ballistics and fire control. We gave an entirely unsatisfactory course in the theory of electricity and magnetism, but went into great detail as to the construction of motors,

dynamos, and distribution systems. Our course in English was confined to rhetoric and composition and that in history consisted of a brief and unsatisfactory treatment of American naval history. Such fundamental sciences as chemistry and physics were given scant attention. Worst of all, we used, almost exclusively, extremely amateurish textbooks written by and for the Navy.

Today conditions are far different. In the first place our entrance requirements have been changed so as to bring them into line with the practice followed at first-rate colleges and technical schools. Prospective candidates for the Academy may now complete their high- or preparatory-school courses instead of interrupting them to attend cramming schools. Moreover, the character of the subjects included in the entrance requirements is now such as to insure our getting men well up to college entrance standards in general education.

The change in entrance requirements has permitted a great expansion in our English and history courses. Midshipmen take now English composition and literature, public speaking, and general naval history as well as United States and modern European history. In connection with the course in European history, a series of lectures is given by prominent and able visiting lecturers.

Of the fundamental sciences, chemistry and physics are taught much better than they were twenty-five years ago. More stress is laid on principles, less on pure memory.

In electricity standard textbooks have been adopted in which the main concern is with the theory. The study of construction details has gone largely by the board.

Thermodynamics, the basis of all heat engineering, has been added to the course at the expense of the study of details of construction of marine engines. Such study still exists to no small degree, however, as may be seen from the table given earlier.

In the study of ordnance, more attention is paid than formerly to fire control and ballistics, less to memorizing the sizes, shapes, and names of torpedo and gun parts; and the large, red, and totally obsolete book familiar to students of a quarter of a century ago has gone into the discard.

The above improvements in the engineering and professional courses, together with the omission of two review months yearly, have made time available for the addition of such subjects as alternating-current electricity, radio, heavy-oil and gas engines, oil burning, airplane construction and ordnance, flight tactics, and communications.

The resistance to the adoption of standard textbooks for subjects not strictly naval is disappearing with the result that pedagogical tendencies in colleges and technical schools come quickly to the attention of Naval Academy authorities.

The time-honored method of teaching technical subjects by omitting fundamental considerations in favor of requiring the memorizing of details of machine parts is finding less and less favor.

There are three ways in which to educate an engineer or technician. He may be instructed thoroughly in the fundamental sciences and in the theory upon which his profession is based, the mastery of details of completed machines, systems, and structures being left for accomplishment by the individual after graduation. The second method of education is to cover fundamentals and theory less thoroughly, perhaps, and to stress knowledge of completed arrangements and systems, operating procedure, and the like. The third method is to ignore theory and to attempt to attain thoroughness in details. The last method is exemplified in the trade school; it may be all right for making locomotive engineers, motormen, and "practical" technicians of all kinds, but rarely or never will it produce a man of vision, a leader rather than a follower. The second method may turn out able men but it is uneconomical of time and in a four-year course leaves little or no opportunity for imparting other than technical knowledge. The time devoted to construction details may be almost wasted especially in such branches as Diesel engineering and aëronautics in which the student's so-called "practical" knowledge may be obsolete by the time of his graduation. He may then find that he has been chasing a will-o'-the-wisp. In the opinion of the writer the first method is the ideal one. It is economical; it tends to develop originality, interest, and ability to think; and it permits inclusion in a four-year course of much general study calculated to

broaden the student and to give him vision and knowledge of life and of events.

Liberalization of Academy Course

Within the last few years the Naval Academy has been the subject of attack from responsible sources on the grounds of the narrowness of its curriculum. Unfortunately the critics lacked the knowledge or the inclination to suggest concrete changes in the course which would accomplish the end desired without sacrificing professional study to such an extent as to make it impossible for the Academy to fulfill its mission. Whether as a result of the criticisms or not, however, the Academy has liberalized its course to no small degree, as has been pointed out already in this paper. Moreover, there has been official recognition of the shortcomings of the general education given midshipmen; witness the establishment of the general line course at the Postgraduate School intended to give greater general information and culture to selected graduates. For the purpose of accomplishing the same results for all midshipmen, proposals have been made from time to time to extend the Academy course to five or six years. Such suggestions have wilted in the face of many practical difficulties.

If the importance of general education in the equipment of a naval officer be recognized, the question naturally arises, "Is it practicable to give such education without extending the course and without cutting down unduly on technical study?" The writer feels that it is not only practicable to do so but extremely desirable, and he is prepared to make concrete suggestions looking to this end. His suggestions are based on the adoption of the first method of teaching engineering subjects, that is by giving fundamentals and basic theories almost to the exclusion of details of construction. The Academy is especially well adapted to such a method, for its course includes three summer cruises during which midshipmen may acquire a great deal of practical knowledge of engineering installations provided they have first mastered the theory upon which the designs were based. When they graduate they should not be greenhorns as operating engineers, therefore, even though drastic cuts have been made in their academic study of machines, parts, and details.

Having the above considerations in mind, the writer feels that it would not be unreasonable to make the following cuts:

Reduce the time assigned to mechanical drawing, mechanisms, engineering processes, boilers, engines, naval construction, turbines, and aircraft construction by seven term (semester) hours.

Reduce the time assigned to physics and A.C. electricity by four term-hours.

Reduce the time assigned to mathematics by five term-hours.

Recent rearrangements in the course in mathematics will make available two hours without curtailment of the course. Three more hours may be saved by dropping differential equations, a study of great value but somewhat too advanced for the needs of the Academy.

The above deletions would make available a total of sixteen term-hours which could be assigned to general studies. A tentative schedule for the use of this time is offered as follows:

Economics, three hours.

Government, three hours.

History of South and Central America, Pan-American relations, three hours.

Biology, three hours.

Public speaking, argumentation and debate, two hours.

Comparative literature, two hours.

Although the writer sees no valid objection to the ultimate adoption of the above drastic changes, he believes that it would be wise to introduce them gradually by making initial cuts of five hours in drawing and machinery, two hours in A.C. electricity, and two hours in mathematics, and by using on the first three courses listed above the nine hours thus obtained.

Criticism of the above suggestions may be made on the ground that their adoption might make the engineering instruction at the Academy too theoretical. The answer is that the only effective approach to the practical in engineering is via the theoretical.

In conclusion the writer wishes to disclaim a desire to offer unconstructive criticisms of the curriculum and policies of this great school. He has ventured to make the above radical suggestions only because of his conviction that their adoption would result in an improvement of the mental equipment of those graduated.

Sealubbers

By LIEUTENANT A. R. MCCRACKEN, *U. S. Navy*

During the ten years since I first swore to uphold the Constitution of the United States and accepted Navy Regulations as an unfailing, if at times exacting, counselor and guide, I have laughed long and loud at landlubbers. I have been as impatiently amused at the fears of landlubbers as any apprentice seaman in his first month at training school. I have been bored by answering, politely, I hope, the most foolish question of a school girl on her maiden visit to one of the "grim grey floating fortresses." I have been cynically entertained at the fascination of the public when it sees a close-up cross-section of that complex bustle of bugle calls, boats, and bells which makes a living hell for an officer-of-the-deck. I have excused those dinner guests of my shipmates, who some evening during a month when the wardroom mess bill was unusually high, have remarked enviously: "Doesn't the government furnish wonderful food for you Navy people!" But I admit that I was once forced to deal firmly with a visitor who observed the new uniform of her dinner partner, a uniform which might cost half his next month's pay, and effused, admirably: "My, the government certainly does pick out lovely cloth for your uniforms." And in my pride I continued to laugh at the landlubbers as I translated for their wondering ears the inscription on the Naval Academy seal: "Ex Scientia Tridens." Little did I dream that the tables would ever be turned, that instead of my laughing at landlubbers, from an isolated and protected position, I should find myself in a strange world, buffeted by those very beings I had scorned; find myself unable to understand their ways and customs, a fish out of water, literally as well as figuratively.

After four years of relative confinement at the Naval Academy, begun at ages between sixteen and twenty, the graduate proceeds to sea for a period which is guaranteed by Navy Regulations to be at least five years. During this time he is concerned with the details of an organization whose traditions rest upon the defeat of tyranny and the suppression of piracy. So exclusively is he engaged in maintaining and increasing the efficiency of the ship whose forebears brought terror to the hearts of Barbary pirates that he gains no familiarity with the methods of the modern-day buccaneers on the beach, and when his first tour of shore duty at last arrives he finds himself helpless to outwit the tactics of the predatory shoregoing raiders. Thus he is suddenly launched, in his maturity, into the midst of a deplorable state of affairs which his brother ashore has been trained through years of bitter experience to make the best of. But even in his ignorance the naval officer would be blind indeed who had not observed and absorbed, despite his life at sea, the first principle of business that affects him. He generally realizes that if you go in uniform they charge you more, but any deeper insight concerning economic life is a rarity possessed only by studious members of the Supply Corps.

The naval officer's financial inexperience is frequently offset by the ability of his wife, if he has one and if she has ability, for during his years at sea she has had to deal first hand with those nefarious schemers who are personally responsible for the difficulties of living in the style to which one hopes to become accustomed. The naval officer in a home environment may be able to look at the clouds and forecast the day, but this information is of little value in connection with the current price of butter and eggs, and besides has been obtained daily by his wife, during his absence, at the nominal sum of two cents a forecast, not to mention the inclusion of reams of exaggerated incidents, magnified accidents, intensified scandals, and erroneous information concerning the movements of her husband's ship.

After years of training at sea to deal with emergencies, threatened disasters, and a pos-

sible enemy fleet, the shoregoing naval officer finds himself totally unprepared to take a reasonably helpful hand in the management and routine of a necessarily modest home. When I first went ashore after six years in the Scouting Fleet, I knew that I was entering upon a mode of life with which I was quite unfamiliar. My anticipations were not incorrect and my first efforts were so futile that at last I was forced to coin and accept a descriptive name for myself and others who may be, not in this case in the same boat, but on the same beach. "Sealubbers" is the only term that correctly portrays our plight. For years we have laughed at landlubbers who ask foolish questions aboard ship, who understand little or nothing of the routine and customs, who could not tell the difference between a square knot and a granny, but it is a high-priced laugh that might be stifled to an ungentlemanly smirk if we realized that we ourselves would one day be sealubbers, ridiculously out of our element.

Our sea habits do not fit life ashore. A watch officer on the bridge or in the engine room must keep his every faculty constantly alert, he must make provision in his mind for every possible accident or emergency. At no time must his attention relax while he is on watch, but afterward he automatically forgets the tension which is then being experienced by his relief, and his mind and body are free to regain their energy, unless his part of the ship was unsatisfactory at the last captain's inspection, or he has had a letter from his wife telling him that little Teresa has whooping cough, measles, flat feet, or rabies, and that the lawn mower is broken down again. Subconsciously, after years of the habit of dismissing nervous tension when he comes "off watch," he carries it ashore. He performs his shore job conscientiously during the day and when he comes home at night he automatically dismisses all cares from his mind. He is "off watch" or such is his subconscious impression. He has long known that, although the Army works from sun to sun, a woman's and a naval officer's work is never done, but one of the discoveries he makes ashore is the difference between a home and a ship. Aboard the former there is no relief and no coming off watch.

When I was aboard ship I never failed to lock the safe containing confidential publications, but for weeks, at home, I invariably neglected to lock one or more of the doors at night. On watch I always asked what boilers were in use but how many times at home have I failed to set the furnace thermostat. Every day of my life at sea on which I had the forenoon watch I reported to the captain, "Twelve o'clock and chronometers wound," yet at home the fact that clocks ever need winding completely escaped my attention. I even failed to turn off electric lights, although every room on my last ship carried a printed admonition to turn them off when not in use. On the other hand I brought home a totally useless habit which was false economy when transplanted from sea to shore. After years of conserving that priceless seagoing commodity, fresh water, I turned it off at home between every application of the tooth brush, a waste of energy, a care that could profitably have been expended in other directions, for the tax is a flat rate annually, and aside from flooding the house, it would make no difference if I overran the bath tub twice daily. The magazine doors of a ship must, of course, be kept closed and I experienced no difficulty in realizing the fact when I was at sea, but how different was the case of the Frigidaire at home, whereas the qualified amphibious naval officer knows that negligence in closing either one is equally apt to cause a violent "explosion." Aboard ship I never failed to make provision for man overboard, or fire, yet at home I continually overlooked certain precautions which must be taken in the daily routine of an infant around the house.

Another obstacle to the progress of the seagoing polywog about to sprout shore legs is the absence, ashore, of any of the spirit or meaning of that fine old seafaring expression "Aye, aye, sir" which every midshipman learns during his first day at Annapolis. In my humble opinion the correct use of that phrase throughout the United States would do more to promote the general welfare than the best five-cent cigar ever sold for a dime. It has not been long since the windows of my home, having been originally very sketchily puttied by a certain firm (name on request), required considerable attention before another long hard winter set in. After several phone calls, an extremely robust workman appeared, and I stated what I wished him to do. He was

not only loath to commence the job, but suggested numerous different remedies which would have to be done by a member of some other profession than his own, this in spite of the fact that he was out of work and had a very populous family, all too young to be of any assistance. Toward the middle of the second day, through the aid of numerous entertaining demonstrations employing the garden hose, and during which I ruined a treasured piece of my wife's needle-point in the living room, I convinced him that the putty leaked and needed replacing. The next day he complained that the work made him tired. Unable to exert my usual self-restraint, I burst out in seagoing equivalents and asked him what kind of work there is that anyone can do without getting tired, and that I often got extremely tired of going to sea. "Well," he drawled, as he puffed at his pipe, while I paid for his time, "I wish I was at sea right now. I always loved the sea." I believe I may be pardoned for wishing that the object of his love had suddenly engulfed him at that moment.

Judging from the difficulties of getting any work done on a house, it is a wonder that the citizens are continually taking themselves to smaller and more expensive apartments, and I am not surprised that a classmate of mine proposes buying a yacht to live on instead of a house. I look forward to the time when a home will consist of a hollow asbestos cube ten feet on a side, or a little less, and if we can believe the advertisements, Valsparred to resist the elements forever. Such a house would be of more comfort to the average family than all the magenta, cerise, topaz, cerulean, and emerald bath tubs and gas ranges ever designed.

In the Navy, three times each day for ten years, I ate what was set before me. Needless to say, those who planned the meals paid little attention to my particular tastes and I frequently found before me dishes which I disliked to such an extent that I went hungry, sustained by a false hope that the next meal might appeal to me. In practically every wardroom in the Navy two factions are constantly at war, the rice-and-curry faction versus the baked-bean faction. One half of the members of the mess object vociferously when either of these dishes is served, while the other half as loudly proclaim its succulence. Personally, I side with those who adjudge rice and curry to be fit only for jaded British colonials, but on an average of once a week I had to accept this despised concoction and in addition, pay for it. During the winter months in Cuba, alligator pears are very cheap, and are served almost daily. Although to me they are nearly as appetizing as soft soap, my mess bill was never reduced because I failed to enjoy the general orgy. Instead, I continued to pay, while my messmates poured on oil and vinegar, and chortled: "This would cost you a dollar in New York." I understand that in South America alligator pears are fed to the goats, but in the United States it appears that the same fruit is sold to them. However, this knowledge persistently failed to buoy me up. In my thoughtlessness I imagined that if a naval officer at sea must accept without protest any article of food set before him, and pay for it as well, it would not be unreasonable to expect a similar acquiescence on the part of a paid domestic at home, but I discovered the error of my ways soon after I was established ashore. My Naval Academy roommate, who had resigned, called me up. He was spending a few days in the city. After four years of sharing a room with him I was more familiar with his tastes than I was with those of my wife, some of which I had discovered through her letters. In high glee I insisted that he have dinner with us the next evening and I held out the glowing inducement that I had not forgotten his overpowering appetite for shrimps. The order for double-decked shrimp cocktails was duly placed where it would do the most good, and the next evening just before dinner my wife made a final check-up on the preparations. As she looked about the kitchen she saw immediately that there was something wrong. "Why, Snowdrop," she began anxiously, "where are the shrimps?" Snowdrop shrugged her shoulders, as she drawled: " 'Deed, Miss, I nevah did care about them snail-shaped fish so I jes didn't trouble mahself to fix 'em."

One of the difficult things for a naval officer ashore to understand is the antique racket. From a life where everything must be the essence of shiny newness, I suddenly found that this very quality is the object of scorn and contempt on the part of women. Never will I forget one of my first errors. I noticed a chair which seemed too marred and

scarred to have a prominent place in a civilized home. Aha, I thought, without a doubt Eve is the most thoughful wife in the world. Knowing how hard I am on the furniture she has gotten this old chair which I can use for my own, lay burning cigarette butts on it, put my feet on it, use it for a stepladder or even for a work bench, and in order to please me she has deliberately sacrificed herself and permitted it to intrude upon the general scheme, even if it does look more or less like a worn-out piece of junk. Just as I sat down to try out its comfort she entered the room. Never have I heard such a piercing shriek. But, what was she screaming? I simply couldn't believe my ears. "Get right up out that chair—don't ever touch it—it's my best antique." Then she sobbingly told me she had spent actually months of searching for this priceless gem, (I suppose it had no price until the old farmer learned that she wanted it), and then to have me come home, and of all the chairs in the whole house, deliberately throw myself into it and go slipping down the ladder-back, rung by rung. "Yes," I agreed feebly, "but do you mean this old chair is not to be sat upon?" "Not unless you want to be," was her hasty retort. Right then I first suspected that there is more to this antique business than meets the eye and my subsequent errors proved the fact definitely.

The next thing I noticed was a clock built in a rectangular case, with a slanted roof. Beneath the face was a circle partially decorated with what had once been, I imagined, a flock of gilt canary birds. Where had I ever seen such a clock? I thought, desperately. At last I had it. When I was a boy there had been one in my grandmother's kitchen. Anxious to restore a general calm after the chair incident, I remarked brightly: "Where did you get the kitchen clock?" I shall not elaborate on the events that followed but the next Sunday I attempted to wind this heirloom of horology. As soon as I had finished, it began to strike. Bong-bong-bong. Ominously at first and then fiendishly. Bong-bong-bong. Monotonously it went on with no sign of stopping. In distress, I called to my wife, but she was already on her way. "Oh, I forgot to tell you" she began, "that the striking side is broken and if you wind it, it just keeps striking until it runs down." It did. I counted the strokes, nine hundred and thirty-six before the last "bong" died away. I was still stunned when Eve said, beaming: "I wish you'd try to regulate it, it doesn't keep very good time—but it is a perfectly darling antique, isn't it?"

However, my errors of antiquity were by no means exhausted. Several nights later we were having a few of my former shipmates and their wives at dinner. As we sat down and I noticed the flowers and candles and salted nuts, I was stirred by a profound pride in the graceful art which Eve makes of living. Here was a picture which deserved to appear in the next advertisement of Maxwell House coffee. I reached for a spoon to attack the fruit cocktail—but what a spoon. Absolutely plain. A kitchen spoon if I ever saw one. Maybe there weren't enough good ones to go around and I had been given a makeshift. I glanced about the table and was horrified to see that everyone had the same cheap sort of spoon. Why, aboard ship, the wardroom spoons were a riot of anchors, chains, stars, cannon balls, and swords. The crew's mess gear wasn't as plain as this spoon which I held in my now trembling hand. "I say," I blurted out, "haven't we any better spoons than this?" and I held mine up. In the confusion that followed I thought I overheard something about ignorance, unappreciativeness, silver coins which had been brought from England by ancestors and made into these spoons just coaxed from Eve's reluctant mother. I was naturally penitent at having spoiled the whole evening quite unwittingly, but it was one more example of a sealubber ashore.

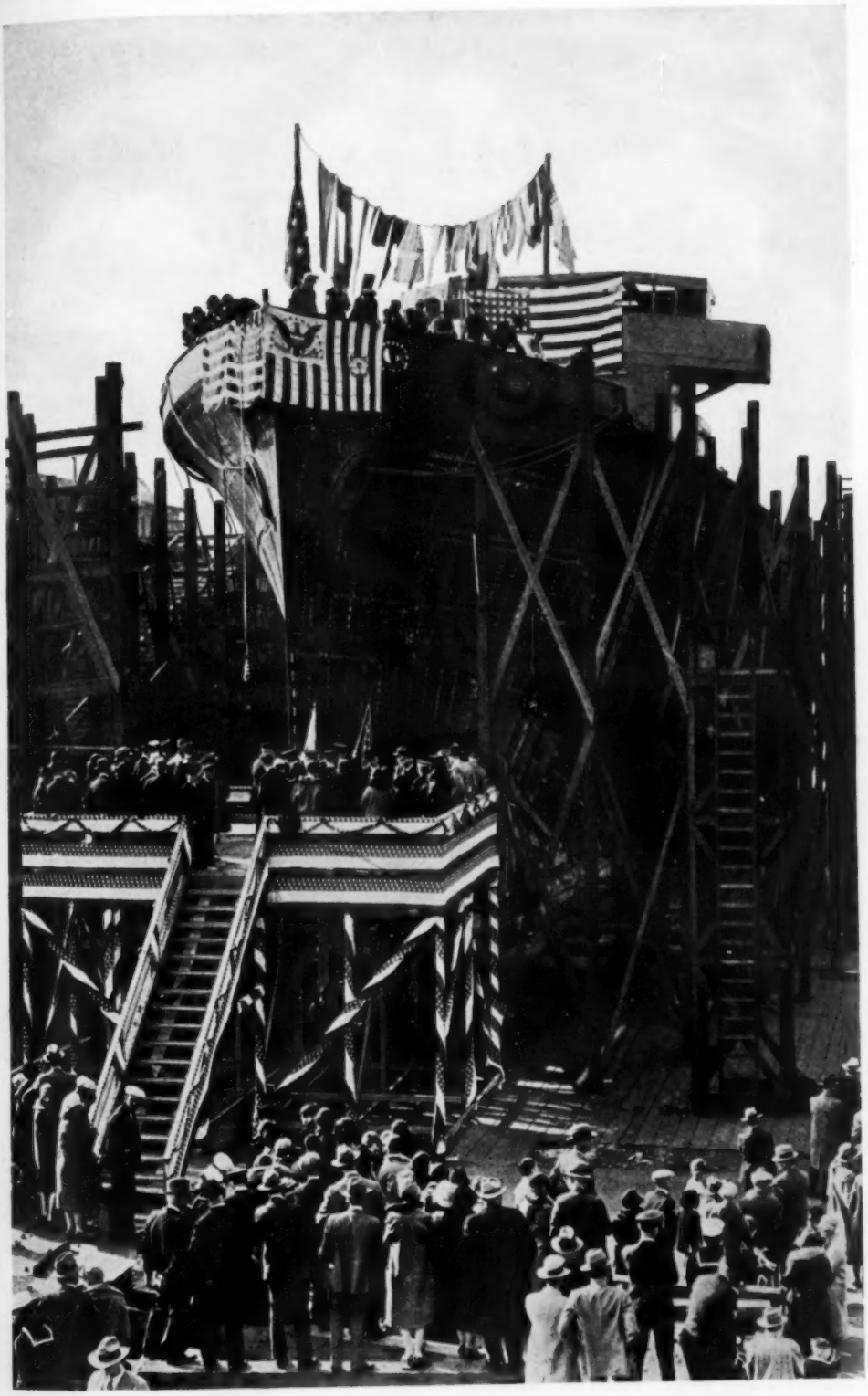
How well do I remember my introduction to the wicked business I have been describing. The ship was in New York and Eve was anxious to visit some of the furniture and decorating shops which, I learned at that time, adorn upper Madison Avenue. I believe the object of her quest was a certain type of scrap basket decorated with a faded picture of smirking ladies in tremendous bustles, a picture which in any reasonably sensible person's hand would be thrown into the scrap basket and not applied to it as an ornament. I have forgotten the number of stores in which a young man, clad in a green smock, lightly fingered a microscopic, pale yellow mustache, and twittered: "Why yes, we can make them up with an absolutely authentic print." One young man did go farther. Not only could he make them up, but he showed

us some he had already made up. There was no doubt in my mind but what he spoke the truth. Unmistakably, he had made them up, all by himself, without training or assistance. Pointing to a very smudgy one, he glowed, as he furnished me with an excellent reply to the captain when next he remarks about the dinginess of the ship. I blush as I quote the words: "Just notice the delightful, charming, subdued tones—the real mellowness of quaint old age."

The requirements of seagoing and shore-staying life aim at results from two diametrically opposed viewpoints. In what I fear are the immortal words of Koko, the clown, "The show's got to go on" applies not only to the five-ring circus, but to the eighteen-battleship Navy. Consequently when repairs to a faltering machine are required, the sole idea of those involved is to make it run properly without regard to the number of men who may have to stay on the job all night so that the ship will be able to steam down the range at target practice early the next morning. No excuses for failure can be offered to the captain. The job must be done. The cost in labor is secondary. If a running light goes out at night it must be repaired even though the bos'n wakes every man aboard ship by his salty, gutteral search for an electrician. It is a different story when a stumbling husband, replacing a fuse, wakes a colicky baby. The means of accomplishing a result becomes equally and often more important than the result itself. "The show's got to go on" becomes altered in such a way that I feel certain no clown guided by his ideal, so corrupted, would be able to produce those side-splitting laughs which we have been trained by song and story to believe are only a forced falsity covering an aching, if not actually broken, heart.

The naval officer first ashore has become so accustomed to considering the desired result instead of the means of accomplishing it that it is difficult for him to reverse the process, a reversal which is essential to his own self-protection. When his car breaks down, the necessary repair is so instinctively all-important in his mind that he fails to inquire as to the probable expense, which staggers him when he receives official notification and seems to include a dozen unasked-for minor repairs at major prices. The difficulties are not limited to garage mechanics alone. In a moment of weakness I once called a plumber to repair the oil-burning furnace, which after running beautifully throughout a moderate fall season had stopped with apparently deliberate forethought on the coldest day in January. After twenty minutes the fire blazed merrily and the plumber's soul must have been similarly warmed, for when I received the bill it amounted to my pay for a whole day. I took up the telephone. "Look here, my good man," I did not begin with these words, "You scratched around my furnace for just twenty minutes and I fail to understand how twenty minutes' time of every man in a whole ship's company could be worth the amount of this bill. At sea I take a four-hour watch on the bridge in a howling gale, am responsible for the safety of the ship and lives of the crew, including mascots, and I don't get that much all day. Furthermore you forgot to bring your tools and I had to loan you my silver bottle opener which you ruined. Your twenty minutes' service is listed in an imposing array of words such as cleaning, inspecting, adjusting, regulating, and lubricating, below which appears a preposterous figure to compensate for a slight dirtying of your hands. On that basis every fireman aboard the old Navy coal burning ships should have received about $675.00 a day." But it was hopeless. I was talking Greek to him, or rather, talking Navy to a landsman.

Upon some inquiry I find that I am not the only naval officer who is experiencing difficulties with shore life. A very good friend of mine started out as equally negligent as I in the matter of estimates before he contracted for any work. In spite of his wife's entreaties he continually overlooked this important point. When she asked him if he had gotten an estimate, the answer was invariably, no. Each time he was staggered when the bill came in, and each time she insisted that it was twice too much. After months of intensive training, however, he became thoroughly proficient in the estimate business. His wife had not been feeling well and he had urged her, repeatedly, to consult a physician, until at last she yielded to his demands. When she returned, his first anxious question was: "Did you get an estimate?" "Of course I did," she replied, "Although the doctor is not certain, he believes it will be twins."



Courtesy Mr. Raymond J. Walker

THE LAUNCHING OF THE UNITED STATES COAST GUARD CUTTER *ITASCA*, AT OAKLAND, CALIFORNIA

This is the first of four cutters under construction at the plant of the General Engineering and Dry Dock Company.

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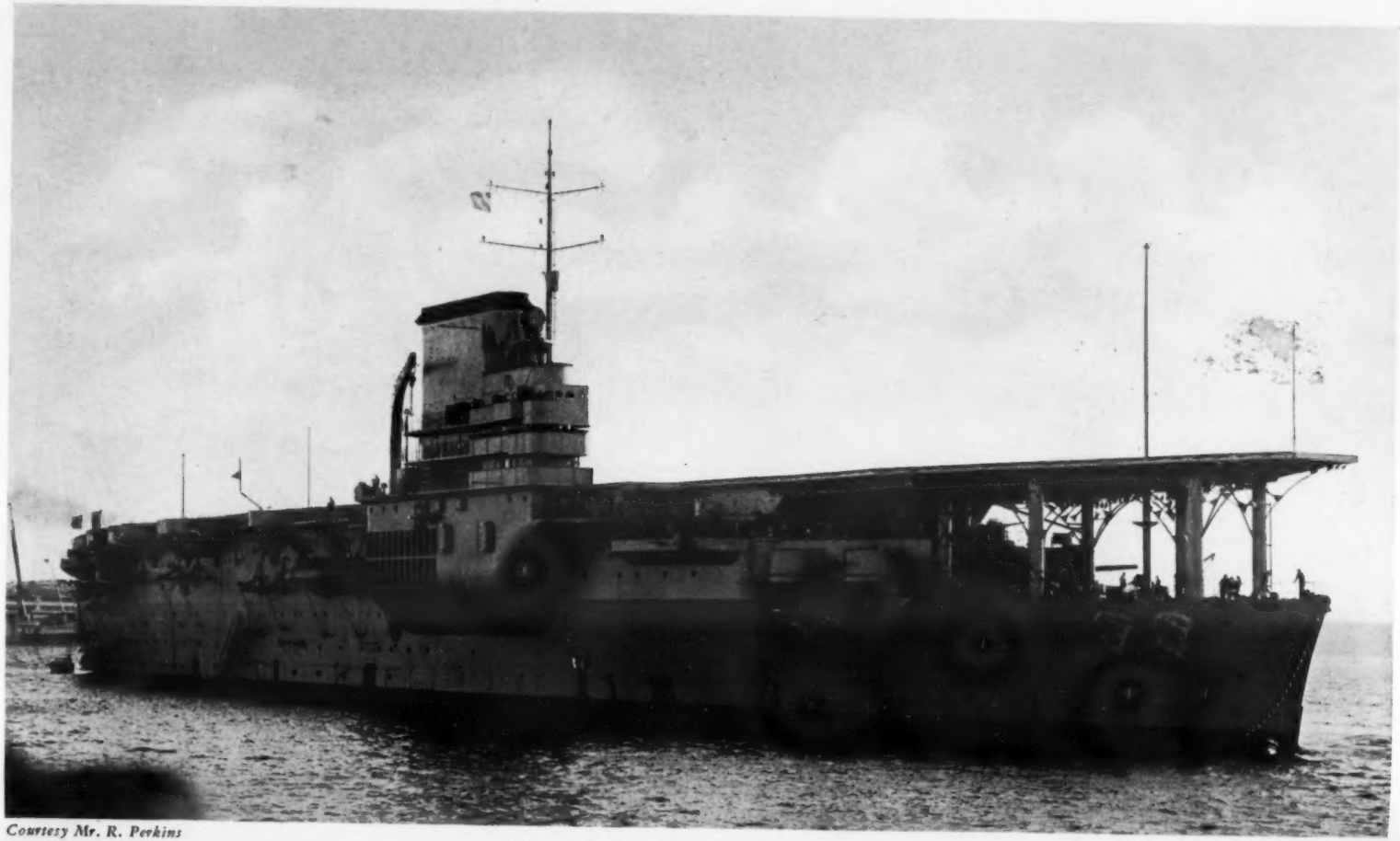

Courtesy Mr. R. Perkins

THE FRENCH AIRCRAFT CARRIER *BEARN*

Courtesy Mr. R. Perkins

THE FRENCH AIRCRAFT CARRIER *BEARN*

International News Photos, Inc.

LAUNCHING ITALY'S LARGEST SUBMARINE

The *Santorre Santarosa,* newest and largest of Italy's submarines, being launched at Spezia, Italy, the famous naval dockyard of the Mediterranean. The craft has disappearing guns mounted on the decks.

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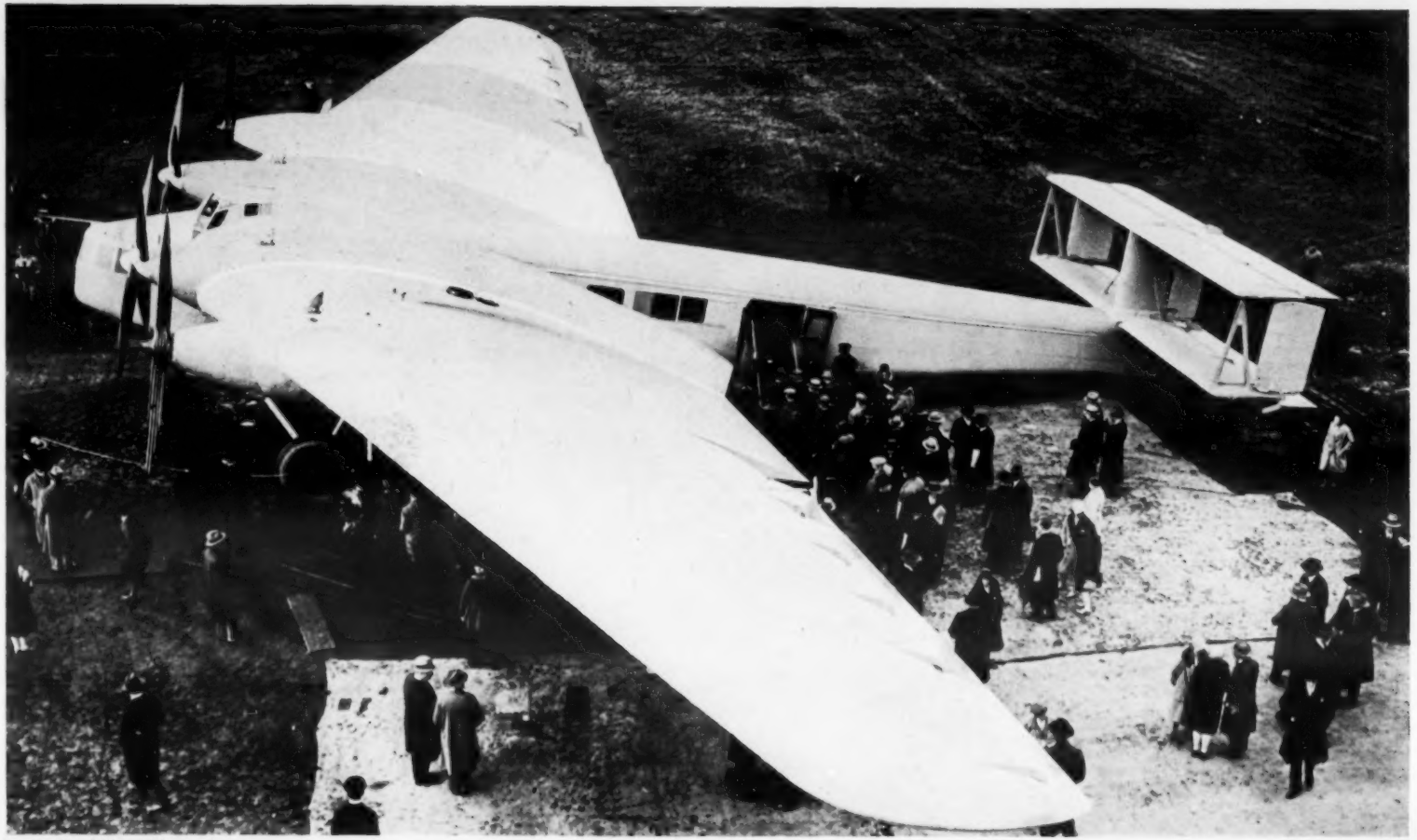

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PASSENGERS ENTERING NEW JUNKERS PLANE FOR TRIAL FLIGHT

The new Junkers plane, *G-38*, carrying passengers in its wings instead of its fuselage, prepares for its trial flight, which lasted for ninety minutes and proved entirely satisfactory. This is believed to be the first time in airplane history that passengers found their accommodations in the wings of the plane. The engine is 2,400 horsepower and the ship is equipped with two small subsidiary planes placed just over the tail.

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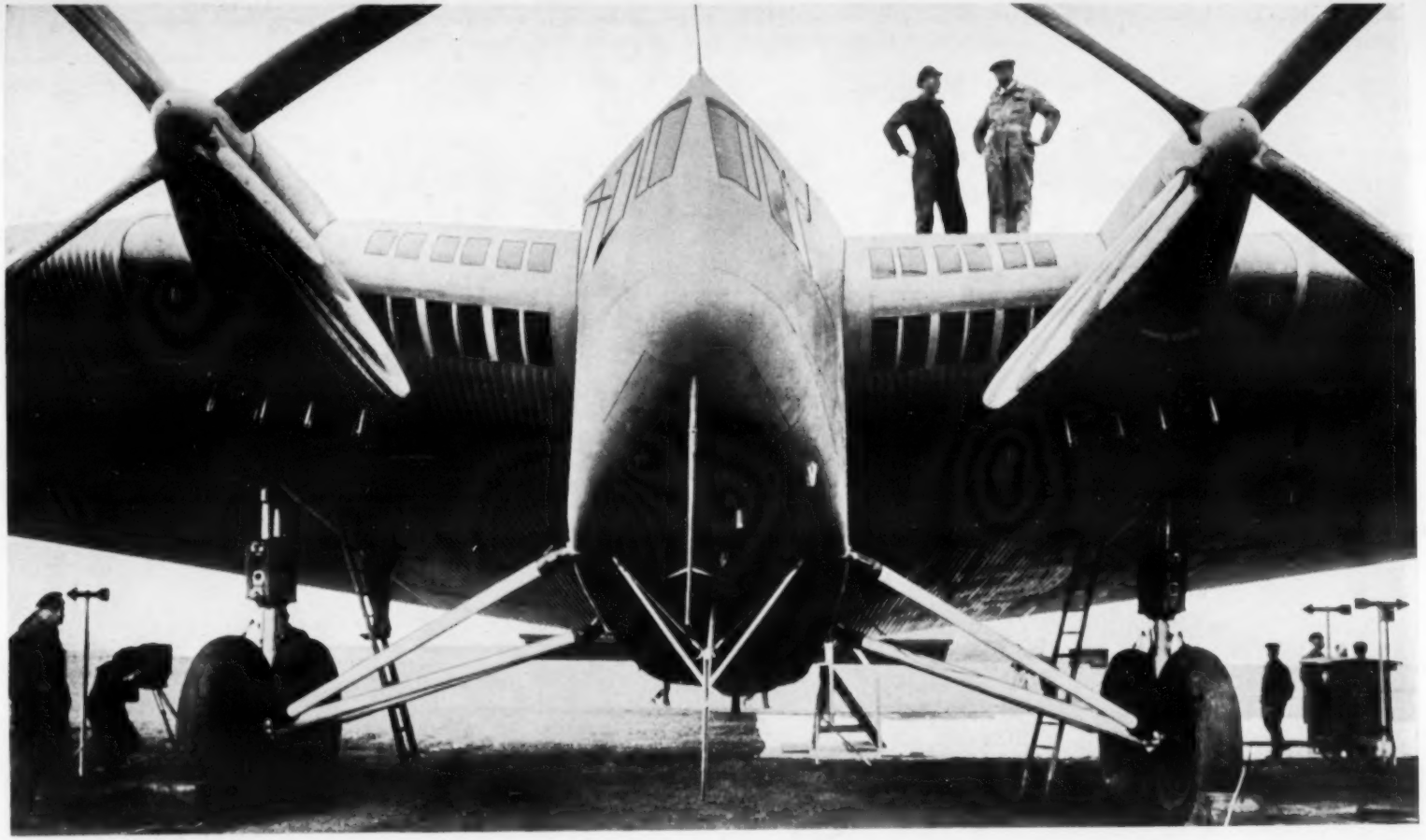

International News Photos, Inc.

A BIRD THAT TAKES PASSENGERS UNDER ITS WINGS

Another view of the new Junkers plane, *G-38*, showing the novel arrangement by which passengers are carried in the hollow wings on either side of the fuselage.

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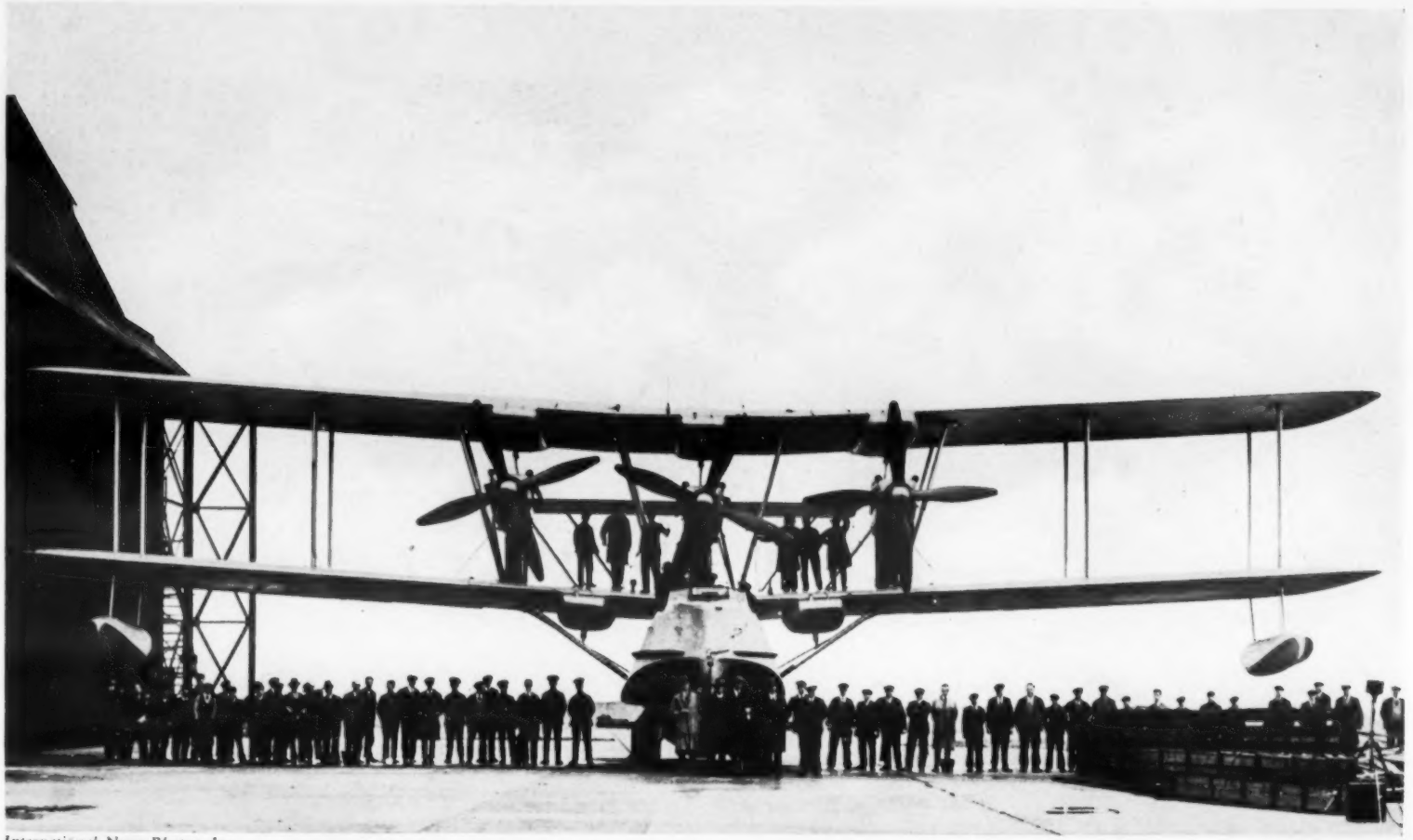

International News Photos, Inc.

LARGEST BRITISH ALL-METAL FLYING BOAT READY FOR ENGINE TEST

Britain's largest all-metal flying boat, *Iris III,* outside the hangar for the first time in preparation for an initial engine test and trial flight. The huge ship has a wing span of one hundred feet and is supplied with three engines. The above striking front view shows its size as compared with that of the men. The ship was constructed for the use of the Air Ministry in coast-patrol work.

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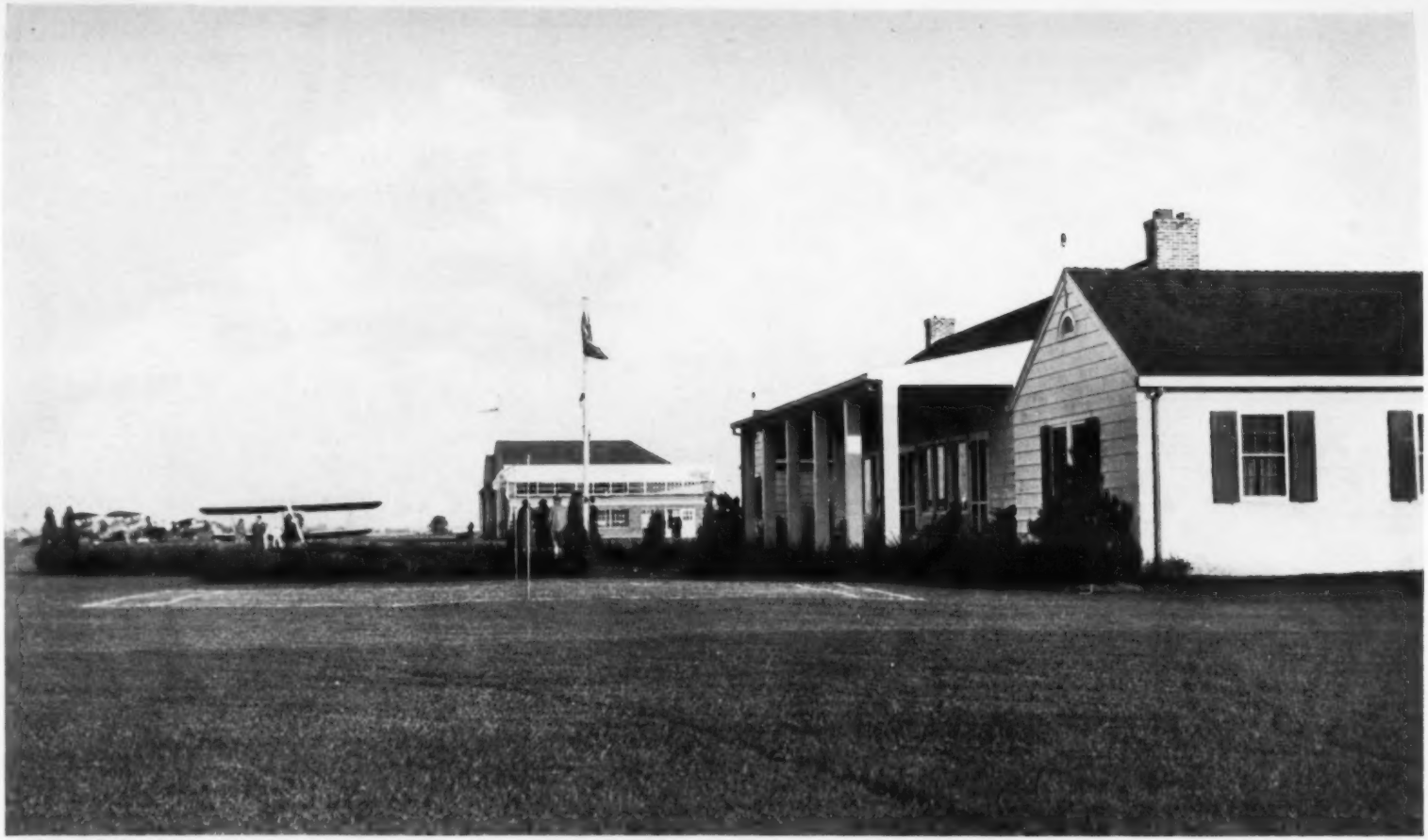

By Ewing Galloway, N.Y.

A SOCIAL COUNTRY CLUB FOR FLYERS—THE FIRST OF ITS KIND IN THE WORLD

The Long Island Aviation Country Club here shown, with the club house on the right and the hangar in the middle background, is unique among country clubs. Established in May, 1929, it is devoted exclusively to aviation as a sport, and has an enthusiastic and highly exclusive membership.

UNIV. OF CHI.

By Ewing Galloway, N.Y.

BACK TO THE CLUB AT SUNSET AFTER SEEING A FOOTBALL GAME AT THE YALE BOWL IN NEW HAVEN

By Ewing Galloway, N.Y.

BACK TO THE CLUB AT SUNSET AFTER SEEING A FOOTBALL GAME AT THE YALE BOWL IN NEW HAVEN

Courtesy Colonel C. M. Perkins, U. S. Marine Corps (Retired)

MONUMENT DEDICATED WITH APPROPRIATE CEREMONIES ON THE 152D ANNIVERSARY OF THE DATE ON WHICH THE ACTION WAS FOUGHT

(See Discussions)

UNIV. OF MICH.

Courtesy Colonel C. M. Perkins, U. S. Marine Corps (Retired)

MONUMENT COMMEMORATING THE BATTLE OF LAKE CHAMPLAIN
President's guard of marines grouped at base.
(See Discussions)

MONUMENT COMMEMORATING THE BATTLE OF LAKE CHAMPLAIN
President's guard of marines grouped at base.
(See Discussions)

Courtesy Colonel C. M. Perkins, U. S. Marine Corps (Retired)

EXERCISES AT THE UNVEILING OF THE MONUMENT COMMEMORATING THE BATTLE OF LAKE CHAMPLAIN
Former Secretary of State Frank B. Kellogg delivering dedicatory address.
(See Discussions)

UNIV. OF MICH.

Commodore McDonough's victory at the BATTLE OF LAKE CHAMPLAIN. Fought in Plattsburgh Bay, Sept. 11th, 1814.

Photographed by G. FRANK E. PEARSALL, 298 Fulton Street, Brooklyn.

From the Original Painting, by J. O. DAVIDSON, in possession of Hon. S. M. WEED, Plattsburgh, N. Y.

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Courtesy Colonel C. M. Perkins, U. S. Marine Corps (Retired)

(See Discussions)

A Method of Calibrating Range Finders at Sea

By Commander Ralph C. Parker, U. S. Navy

THE desirability of a method of correcting our range finders at sea, with the true range unknown, is too obvious to require comment. Much may have happened to them since we last could use some established calibration ranges in port; and after a prolonged cruise, radical changes in temperature, rough handling from the weather or possibly the enemy, our gunnery officer will approach battle or target practice hoping rather than knowing that his range-finder errors, as last observed, are still correct.

Our later instruments are built with internal adjusters, but the internal adjuster is a capricious and none too reliable mechanism. Its reliability depends largely on the assumption that such influences as time, temperature, vibration, shock, etc., which may tend to produce changes in the main optics, will nevertheless have no effect on the very similar but smaller adjuster optics; an assumption which is not invariably correct, since on occasion the internal adjuster will introduce more error than it will take out!

Calibration has been proposed, using another ship for a target, measuring the sextant angle she subtends when abeam, and from this and her known length computing the true distance. The objection to this is that the sextant, while sufficiently accurate for navigational purposes, can hardly handle angular differences of a second or less, which is what the range finder has to do, and hence is of limited value for establishing true distances in this manner.

The following plan is based on the fact that the range finder itself is nothing but an angle-measuring instrument of high accuracy, which may be used to measure the angle subtended by a base line much longer than itself, and thus in effect multiply its own effective base length and obtain a corresponding increase in accuracy.

This is not unlike the procedure when a destroyer checks her short-base range finder against the big ones of a battleship, but the proposed method goes further than this. When we check little one against big one we merely reduce the unknown error of the former to that of the latter, and the only advantage is the fair assumption that the larger instrument will have less error.

In the following method the entire error is found (in theory) and there should be no residual error. There is nothing magical about it. We simply use the same range finder, first in the normal manner to measure the angle which its own base length subtends at some unknown distance, and second, the angle subtended by a larger known base line at the same unknown distance, and between the two form an equation which may be solved to obtain the true distance and hence the error.

But before proceeding further it is necessary to review the theory of range finders.

When a range finder of base length b is trained on a target at true range R, the light rays from the target to the end pentaprisms make with each other an angle θ, whose tangent is b/R or, using circular measure for greater convenience and accuracy, $\theta = b/R \times 206262$ seconds. For every range R there is subtended a corresponding parallactic angle θ of definite amount.

The rays after entering the instrument would continue at this angle θ with each other, but are refracted into parallelism by the compensator when we turn the measuring knob and make coincidence. There is therefore a certain position of the compensator for every range R and angle θ, and the scale attached to the compensator is marked at each position with the range cor-

(See Discussions)

Courtesy Colonel C. H. Perkins, U. S. Marine Corps (Retired)

responding to the angle compensated. Thus, when a 9-foot range finder shows a true range of 9,000 yards on its scale, it has compensated or measured an angle $\theta = 3/9000 \times 206262$, or 68.7 seconds.

If, however, the instrument read 9,300 on a true range of 9,000, it has in effect recorded an angle of 66.5 seconds; and the linear error of 300 yards is the result of an angular error of 2.2 seconds, introduced through some cause into its optical parts. Should this angular error persist as a constant, it will cause at any other range an error proportional to the square of the range. For example, at 3,000 yards true, the error would be 33 yards, and the scale reading should be 3,033.

The proposed method of calibration rests on the assumption, substantially true, that the linear errors at all ranges *do* result from a constant angular error in the instrument; constant, at least, until some other change occurs. We may now proceed with the proof of the method.

In Fig. 1 assume a range finder FG of base length b, having a constant angular error Δ; also two similar targets T and t, forming a known base line B, at the unknown true distance R.

Training the instrument on T, we make coincidence between its two halves in the usual manner. Now if the range finder had no error we would thus measure the angle θ correctly; and the correct range R would appear on the range scale. But if there is a constant angular error Δ, the range scale will show some other value, R', as though an angle $\theta - \Delta$ had actually been measured, and the target had been at L instead of at T. Record this observed range R'.

Now turn the measuring knob and range scale towards the lower ranges until the two separate targets, T and t, are brought into coincidence. With no error we would thus measure the angle Φ, subtended by the base line B, plus the base length b (since the lines of sight from T and t to the end pentaprisms now cross each other). Their point of intersection will be at some distance, r, which should appear on the range scale if there were no angular error.

But with the constant error Δ, the range recorded will have another value, S, as though an angle $\Phi - \Delta$ had been measured, with the targets at T' and t' instead of at T and t, and at a range R'' instead of R. Record this observed value, S.

It is here necessary to note and remember that the figure is of necessity much exaggerated. In actuality, the angles θ and ϕ are so small that the distances FT, Gt, GN, GT, GM, and GH are substantially equal to each other and to R. Also the angular error Δ and the resulting range errors TL and tt' are sufficiently small so that the triangles LTM and TFG may be considered similar, as also the triangles $t'tN$ and GHt. The error in our method due to errors in these assumptions will be inappreciable unless the range error, TL, is abnormally big, in which case the obvious procedure is to make an approximate correction of the instrument first, and then a refined correction.

From the similar triangles above noted we get: $TM/TL = FG/FT = b/R$, or $TM = TL \times b/R$. Also $tN/tt' = tH/HG = (B+b)/R$, or $tN = tt' \times (B+b)/R$.

But TM equals tN (since they subtend the same angle at the same distance R).

Therefore: $TL \times b/R = tt' \times (B+b)/R$, or $TL/tt' = (B+b)/b$.

Substituting for TL and tt' their equivalents, $R' - R$, and $R'' - R$, we have: $(R' - R) / (R'' - R) = (B + b) / b$ or $b(R' - R) = (B + b)(R'' - R)$.

Simplifying: $bR' - bR = BR'' - BR + bR'' - bR$, whence

$$R = \frac{BR'' + bR'' - bR'}{B} \text{ or } \frac{R''(B+b) - bR'}{B}$$

From the similar triangles in the figure, $R''/S = (B+b)/b$, or $R'' = [S(B+b)]/b$. Substituting this value of R'' in the preceding equation, we get

$$R = \frac{S(B+b)^2}{bB} - \frac{bR'}{B}$$

which gives us the true range R, in terms of the known quantities B and b, and the quantities obtained by observation, S and R'.

The expressions $(B+b)^2/bB$ and b/B are both constants for any one type of range finder and any particular base line between targets; hence they may be designated by the constants K and k respectively, whence the formula becomes $R = SK - R'k$.

These constants may be computed beforehand; and when the scale readings R' and S have been observed, it is then only necessary to apply these constants K and k to find the true range R.

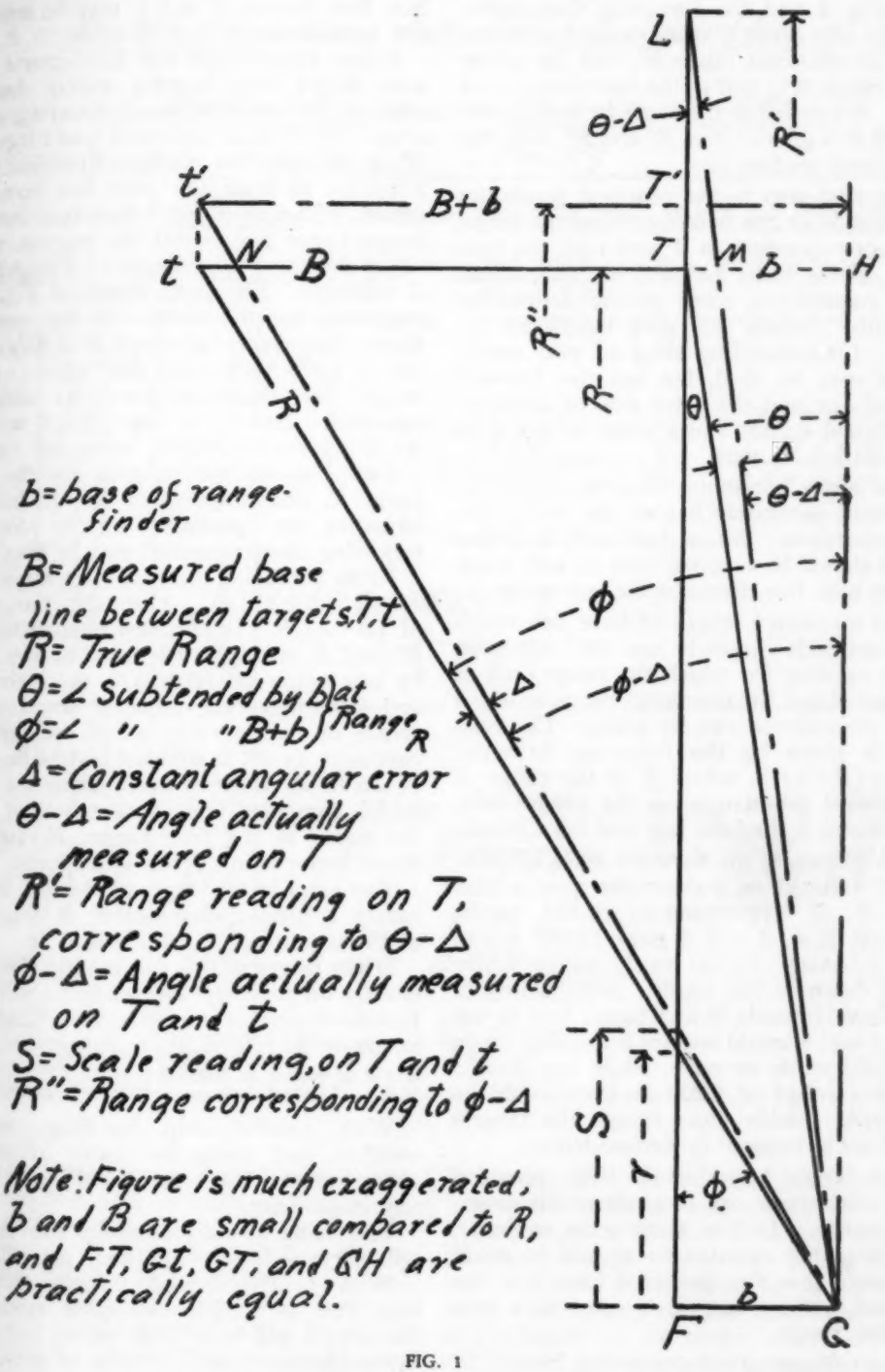

L
θ-Δ
R'
t'
B+b
T'
t
N
B
T
M
b
H
R''
R
θ
θ
Δ
θ-Δ
φ
Δ
φ-Δ
b=base of range-finder
B=Measured base line between targets T,t
R=True Range
θ=∠ Subtended by b at
φ=∠ " " B+b } Range R
Δ=Constant angular error
θ-Δ=Angle actually measured on T
R'=Range reading on T, corresponding to θ-Δ
φ-Δ=Angle actually measured on T and t
S=Scale reading, on T and t
R''=Range corresponding to φ-Δ
Note: Figure is much exaggerated, b and B are small compared to R, and FT, Gt, GT, and GH are practically equal.
S
φ
b
F
G

FIG. 1

In Fig. 1 and the foregoing demonstration the true range R was assumed to be less than the observed range R', and the calculated range R''; that is the instrument read high. We arrive at the same formula, however, if R is greater than R' and R'', with the instrument reading low.

The first step in the practical procedure is to decide on the two objects on the target ship corresponding to T and t of the base line. These must be such as will afford good coincidence, since poorly defined or dissimilar objects will give inaccurate results. Corresponding sides of two smoke stacks may be used, but not the forward side of one and the after side of another; nor should a mast and a stack or any such combination be used.

The exact horizontal distance should be measured accurately before the calibration is undertaken. Ships habitually together at sea should be supplied with all such practicable base line distances on each other.

The maximum length of base line which is practicable depends on the ***minimum*** range reading for which the range scale is graduated and the maximum range at which good coincidence can be made. The relation is given by the following formula: $R/S=(B+b)/b$, where R is the range, S the lowest graduation on the range scale, and B and b the base line and base length.

For example, the forward sides of Nos. 3 and 4 stacks on a destroyer gave a base line B of approximately 4.583 yards, whereas Nos. 2 and 4 gave 12.875 yards. The 1.5-meter (1.640 yard) range finder reads down to 700 yards. Substituting in the above formula it was found that to use Nos. 3 and 4 would require a working range of 2,660 yards or over, while for Nos. 3 and 4 a range of 6,200 or over would be required. Inside these ranges the targets could not be brought into coincidence.

The larger base line is best, provided good coincidence can be made at the necessary range. Before starting to calibrate, the foregoing calculations should be made to insure that the proposed base line can be used without having to open to a prohibitive range.

The calibrating ship, assuring herself of the exact course and speed of the target ship, opens out to the calculated range for calibration, or without calculation, until the base line targets T and t, may be brought into coincidence with each other.

When steadied on the base course and with target ship bearing ninety degrees relative, the observations are started, coincidence on T alone and on T and t together being alternated as rapidly as possible until a set of at least ten each has been obtained. The ship may then open out to longer range and repeat the process, using either the same base length or a longer one if available. The form shown in Fig. 2 is suggested for the work. In the example shown the errors obtained at 2,697 yards and at 5,878 yards obey the "square of the range" law about as closely as could be expected. Errors in observation will always prevent absolutely consistent results.

Fig. 2 shows the solution for the true range R, and range error $R'—R$, but for adjusting the instrument on the spot, the following shorter method may be used:

From preceding formulas we know that $R''=[S(B+b)]/b$. Compute the value of $(B+b)/b$. Take a few observations of R' and S, multiply the mean of the latter by our value of $(B+b)/b$ to obtain R'', and then move the adjuster so as to increase or decrease the range readings accordingly as R'' is greater or less than R'. When R' as observed averages up the same as R'', computed from S, then both of them are equal to the true range, R, and the range finder is in correct adjustment.

Any error in the length of the base line B, causes a proportionate error in the value of the true range R, obtained.

If the target ship is not exactly abeam or exactly on the base course, there will be a foreshortening of the base line, producing errors of the following percentages:

Error in course or bearing ..	2°	5°	10°
Value of calculated range R	99.9%	99.6%	98.5%

With careful ship handling, smooth weather, and using the mean of several observations, this error should not be of any importance.

The value of calibration by this method will vary with the conditions attending it. With poorly defined targets, doubtful base line, or with considerable motion of the ship, it will be of little value; but under favorable conditions it will be of more than fair accuracy, and at the very least will serve as a check to tell us whether our range finder has gone very far wrong.

U.S.S. Hull . Range Finder, Mk. X-1 Base 1½m No ____

Target Ship Macdonough , Course 265 , Speed 10

TARGETS T and t Nos. 3 & 4 Stacks

Base Line, B 4.583 yds. R.F. Base, b 1.6404 yds. B+b 6.2234 yds.

$\frac{(B+b)^2}{b.B}$ = K 5.153 , $\frac{b}{B}$ = k .35793 , R = K.S − k.R'

Log .71206 Log 9.55380

Time	S (On Tt)	R' (On T)
1050	712	2740
	708	2680
	710	2750
	720	2730
	721	2790
	718	2740
	710	2790
	710	2800
	722	2840
1115	724	2790
	715.5	2765

K log .71206 k log 9.55380
S " 2.85461 R' " 3.44170
KS " 3.56667 kR' " 2.99550

KS 3687.0
kR' 989.7
R 2697.3
R' 2765
Error + 67.7

Time	S (On Tt)	R' (On T)
1145	1600	6150
	1580	6200
	1590	6300
	1590	6300
	1590	6250
	1560	6200
	1600	6300
	1500	6300
	1540	6200
	1580	6200
1208	1610	6240
	1575	6240

K log .71206 k log 9.55380
S " 3.19728 R' " 3.77518
KS " 3.90934 kR' " 3.34898

KS 8111.6
kR' 2233.5
R 5878.1
R' 6240
Error + 362

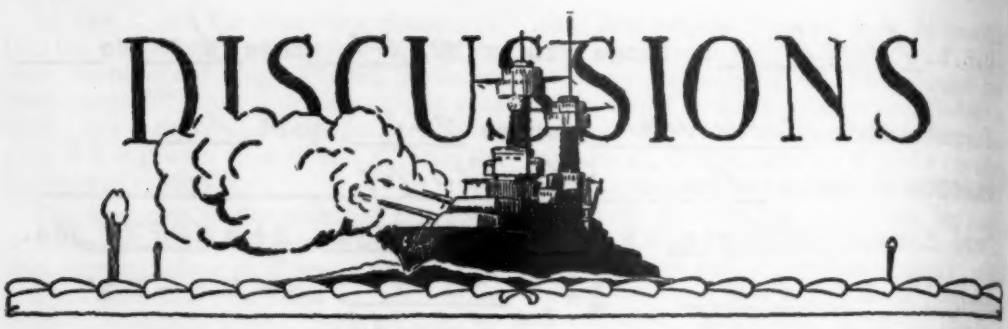
FIG. 2

In port where no calibration ranges have been established, a possible application of it would be to erect on shore two conspicuous battens to form the base line *B*, and use them in the manner above indicated. If the line of the targets were not perpendicular to the line of sight from our anchorage to the targets, we could very easily use its component projected on a line perpendicular to the line of sight.

All the general instructions for accuracy in the use of range finders apply especially when calibration is being done.

In particular it should be remembered that an instrument adjusted at long range will be accurately adjusted for short-range work also, as any residual error decreases as the square of the range; whereas if the adjustment is made at short range only, any residual error will increase as the square and will assume big proportions at long range where the greatest accuracy is required.

DISCUSSIONS



Arnold's Retreat from Valcour Island

(See page 1060, December, 1929, PROCEEDINGS)

COLONEL C. M. PERKINS, *U. S. Marine Corps (Retired)*.—I was very much interested in reading in the December number of the PROCEEDINGS, the account by Mr. L. H. Bolander of the Battle of Valcour (Plattsburgh) and Arnold's Retreat.

As I am now a resident of Plattsburgh and the only officer of the naval service living in this vicinity, I am naturally attracted by the place Plattsburgh and Lake Champlain hold in our country's early history, and, especially, the traditions and glamour of the naval element, linked, strangely enough, with a place so far removed from the sea.

For it was right off Plattsburgh, that the first fleet action of the Navy was fought, which resulted in a glorious victory for our cause—that of Commodore Thomas Macdonough on September 13, 1814. Moreover, the first maritime encounter of any description in which the American colonies engaged took place here, the Battle of Valcour Island, fought October 10-11, 1776, between flotillas manned by British seamen under command of Captain Thomas Pringle, R.N., and General Sir Guy Carleton, commanding the British operations about Lake Champlain and the Canadian border, and the Continental forces embarked and commanded by Benedict Arnold.

The historical account given by Mr. Bolander is probably the best extant, but even this is deficient, owing to the uncertainty of the tactics used by Arnold in his escape from the British squadron, due to the paucity of contemporaneous records of the action. While not a victory for the American arms, it is worthy of being preserved in the annals of the Navy (although a navy, as such, did not then exist), first, because it was the initial action in which the Colonies contended against the might of England for the supremacy of the seas, and, second, because of the consummate skill and valor displayed by the American commander, General Arnold, whose name, unhappily, lives only to be execrated by his countrymen for his later act of perfidy. Remembered chiefly in history as a traitor, his fame as a brave and skillful soldier seems to have been almost totally forgotten, except here, in Plattsburgh, where a monument has lately been erected to commemorate the part which he took in this memorable action.

As this fact is perhaps unknown to the members of the Institute and readers of the PROCEEDINGS (no mention having been made of it in Mr. Bolander's article), I am taking the liberty of forwarding to the Secretary a photograph of the monument, or marker, erected a year ago by the local chapter D.A.R. of Plattsburgh and dedicated with appropriate ceremonies on the 152nd anniversary of the date on which the action was fought, October 11, 1928.

In these ceremonies, conducted by Saranac Chapter, D.A.R., and the patriotic citizens of Plattsburgh and Clinton County, New York, the troops of the 26th Infantry, U. S. Army, from Plattsburgh Barracks, participated, music being furnished by the regimental band, and the address delivered by one of the officers, Captain Leroy W. Nichols, 26th U. S. Infantry.

This is perhaps the only occasion in this country where official honors have been paid to the memory of a traitor. Because of this fact, and for the further reason that it marks the initial effort on the part of the newly seceded colonies to wrest from the mother country her maritime supremacy, I am send-

ing photographs of this interesting event to the Naval Institute, thinking that it may be deemed worthy of mention.

As I noted above, Plattsburgh's claim on the Navy for interest and recognition does not rest on this historical incident alone. Here, in Cumberland Bay and off Crown Point, on September 13, 1814, Macdonough fought the Battle of Plattsburgh and won the victory of Lake Champlain, the first fleet action of any note in our history.

I am sending, along with the other photographs, a cut of this celebrated action reproduced from the spirited painting by J. O. Davidson, which now hangs in the City Hall, Plattsburgh. Also, photographs of the magnificent monument commemorating this battle, the dedication of which took place two years ago (the Navy's representative was Rear Admiral Charles P. Plunkett) with the President's guard of marines grouped at the base. Another view depicts Secretary of State Frank Kellogg delivering the dedicatory address.

The Construction and Repair Department of a Battleship

(See page 965, November, 1929, PROCEEDINGS)

LIEUTENANT COMMANDER F. S. CRAVEN, *U. S. Navy.*—One can enjoy and appreciate Lieutenant Commander De Treville's article without having been first lieutenant of a battleship. It is delightfully written. Let us hope for more.

Without experience as a first lieutenant it would be unwise to comment upon the changes in battleship organization which the article suggests, but this experience is not needed to fit one to comment upon the iniquities of the present bureau system for the production and maintenance of material. Lieutenant Commander De Treville points out the overlapping of bureau cognizance, which is one defect of the system and, in discussing the article in the same number of the PROCEEDINGS, Commander H. S. Howard, (C.C.), indicates another, which is interlocking of cognizances. He brings up the question of C & R ammunition hoists which raise Ordnance ammunition from C & R magazines and deliver it to Ordnance guns.

But this is a quite harmless example. For others more productive of harm let us consider the utilization of electricity on board ship. Four bureaus concerned with ship design use it. Both Ordnance and Engineering have their own types of firing key, selector switch, and flexible cable—a few of the numerous examples of duplication—that is, overlapping of cognizance. Now consider the modern electro-mechanical system for the control of gunfire. Ordnance supplies the gun director at one end and the range keeper at the other, but Engineering supplies the wiring between them and the switchboard which enables control to be exercised from one of several stations, and Navigation supplies the gyro compass which makes the range keeper a success. Only C & R fails to get in on this prime illustration of the interlocking of cognizances.

It might be possible to eliminate overlapping of cognizances while retaining the present bureau system. Lieutenant Commander De Treville has made suggestions which would eliminate a number of them. A thorough job along that line would save the Navy much money and probably increase its effectiveness. The money would be saved in several ways. Overhead costs would be reduced because one bureau of two now producing similar equipment would no longer need the personnel now employed in producing it. Equipment costs would be reduced because a smaller stock of spare parts would be needed. For example, fewer spares would be needed to maintain say, twenty firing keys of identical type than two different batches of ten each. Increased effectiveness would be expected because the operating personnel would have to be familiar with fewer types of equipment and would be helped by the fact that all equipment of a certain character would be developed along similar lines, being the work of the same group of designers.

But to eliminate *interlocking* cognizances while retaining the present bureau system would be difficult. In the previously given example of gun-control equipment, giving gyro compasses and firing keys and fire-control wiring and switchboards all to Ordnance would not solve the problem because Engineering must still produce wiring and switchboards for other purposes, again involving us in interlappings. Nor would we solve the problem by giving gyro compasses, range keepers, and gun directors to Engineering, because the output of the system is azimuth and elevation of the guns, involving an electro-mechanical gun attachment which is an integral part of the system as a whole.

The evils of interlocking cognizance include added cost, reduced operative efficiency, and sluggish development of new conceptions. The added cost and sluggishness of development work result chiefly from lost motion between coöperating agencies. Design and installation mistakes are made—it is not apparent how they could very well be avoided entirely, under the present system—and it is expensive to correct them. Developments in several important lines—notably gun control—involve the purely coöperative participation of two or more bureaus which draw their funds from different appropriations and which necessarily conduct their time schedules to suit internal bureau demands rather than inter-bureau requirements. The coöperation of individuals from different bureaus will often make the system work, but the prospect of its failure is ever present.

To avoid these evils there is needed individual responsibility for whole developments (such as the gun-control system) combined with control of all needed funds and the power to *coördinate* the personnel involved. At present we have divided responsibility, divided funds, and coöperation.

Reduced operative efficiency derives chiefly from poor general design. A system developed piecemeal, by delegation among several coöperating agencies, should not be as good as a similar system developed entirely by the same agency under the control of a responsible individual. Proof by comparative example is not available because all our own products are the development of the same organization and we do not have at hand for critical comparison the similar developments of other navies. But there are a number of specific instances of poor design well known to those familiar with the history of our recent ships. The notorious process of alteration of new ships, usually commencing while the ship is still in the builder's hands, is an indication.

Commander Howard does not make a strong case for retaining the existing bureau system—but then, no one could. It is a haphazard growth, not a scientific development. What we require for material excellence is a single bureau, division, or office—call it what you will—in charge of all material. And to avoid the evils of overlapping and interlocking cognizance we should organize it under design, production, and maintenance, instead of the classified headings of hull, propulsive machinery, and ordnance. In a word, what we require is a functional, not a classified, organization.

This subject is an important one and merits service attention. It would be much less painful to make the change in peace time, thereby improving the quality of our ships before they are called on to demonstrate their worth in battle.

PROFESSIONAL NOTES

1 December to 1 January

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Lieutenant Commander D. C. Ramsey, U. S. Navy
and
Professor Henry Bluestone, U. S. Naval Academy

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UNITED STATES

Stimson Differs With U. S. Experts on Battleships

Baltimore *Sun*, Dec. 21.—By Drew Pearson. Discussions with the Japanese delegation here this week have revealed two important differences between the naval views of the State Department delegates and the naval views of its naval advisers.

One of these is in regard to the importance of capital ships, regarding which Secretary of State Stimson and the Japanese were in the most unanimous agreement, believing that they should be gradually relegated to the background.

The other is in regard to submarines, in which category the Japanese desire practically as many as the United States.

In addition there has been throughout the entire summer's naval negotiations with Great Britain a difference of opinion between the State Department and the Navy in regard to the importance of the 10,000-ton cruisers.

The difference in opinion between the State Department and the Navy in regard to the capital ship has been brought to light by an article by Captain A. H. Van Keuren, chief naval constructor of the Navy, recently published in the *Marine Review*, in which he maintains that the battleship is the only vessel "designed to stay in and take it. That is why battleships must be retained."

This view appears to be at some variance with that of the chief American delegate to London, Secretary Stimson, who has emphasized the point that battleships, being infinitely more expensive and more burdensome on the taxpayer, are more important as far as reduction goes than cruisers.

Secretary Stimson has even gone out of his way to emphasize that the press has been giving too much importance to the scheme to reduce cruisers because the reduction of battleships was going to be one of the most important accomplishments of the London Conference.

Captain Van Keuren has been chosen as one of the advisers to accompany Secretary Stimson to London. He is considered one of the ablest construction experts in the Navy and his views, it can be said, are almost identical with those of the General Board and other Navy men who have the inside track with the Secretary of the Navy.

Captain Van Keuren argues in the *Marine Review* that the battleship is now "nearly unsinkable." Captain Van Keuren continues:

> Compare the battleship with other types of fighting ships. Light cruisers are not protected efficiently against their own guns and must seek safety in flight under a variety of circumstances. This is even more true of destroyers, whose main protection lies in their speed.
>
> The submarine must submerge to avoid gunfire of her enemies. Even the airplane carrier, though equipped with the most modern of weapons in great numbers, must avoid contact with any enemy fighting ship, because of her vulnerable flying deck and her comparative lack of hull protection.
>
> Only the battleship is designed to stay in and "take it." Granting that the fleet has to have a backbone, it must be made of battleships. Nothing else is tough enough, because nothing else has enough size to make it tough enough. That is why battleships must be retained.

Secretary Stimson has considerable support for his views on the battleship from a minority of naval men and probably a majority of aviation men in both the Army and Navy, Rear Admiral William Sims, retired, is the spokesman for the former group and argues that if an enemy approaches our shore the only place for battleships is "up the Mississippi River as far as they can go."

Colonel William Mitchell and a good many aviators in both branches of the service also hold that the battleship is a defunct luxury which costs $37,000,000 to build but can be sunk by an effective air squadron.

Representative Burton L. French, chairman of the House Subcommittee on Naval Affairs, supports Secretary Stimson and goes him one better by maintaining that battleships should be abolished altogether.

The second point of difference between the State Department and the Navy was brought out when it became known that the Japanese would go to London with a demand for 78,000 tons of submarines, which is slightly more than the American effective submarine fleet. The State Department did not seem particularly worried about this, and it was pointed out that this figure was what the Japanese were now building and that this fleet couldn't bother the United States by operating 5,000 miles away.

This is decidedly not the Navy view, however. Naval experts point out that the only trade route in the world upon which the American flag is supreme runs adjacent to

the Japanese Islands. This is the great circle route between San Francisco and Seattle to the Orient, upon which three express passenger lines carrying the American flag operate, as compared with only one British and one Japanese line.

This is the route also which carries a large part of the valuable tin and rubber trade from the Malays, which Rear Admiral Hilary P. Jones, several times, has pointed out as essential to the prosperity and very life of the United States.

Vessels Under Construction, U. S. Navy—Progress as of November 30, 1929

Type Number and Name	Contractor	Per cent of Completion				Probable date of completion
		Dec. 1, 1929		Nov. 1, 1929		
		Total	On Ship	Total	On Ship	
LIGHT CRUISERS						
Pensacola (CL24)	New York Navy Yard	98.3	97.2	95.8	93.7	2/ 1/30
Salt Lake City (CL25)	American Brown Boveri Elec. Corp.	99.8	99.8	99.3	99.3	12/ 9/29
Northampton (CL26)	Bethlehem S.B. Corp. (Fore River)	85.2	84.	81.8	80.2	6/13/30
Chester (CL27)	American Brown Boveri Elec. Corp.	78.2	78.1	75.2	75.	6/13/30
Louisville (CL28)	Puget Sound Navy Yard	59.9	57.3	54.2	51.2	3/13/31
Chicago (CL29)	Mare Island Navy Yard	58.7	54.3	54.	49.5	3/13/31
Houston (CL30)	Newport News S.B. & D.D. Co.	76.6	75.3	74.4	73.1	6/13/30
Augusta (CL31)	Newport News S.B. & D.D. Co.	64.5	62.5	61.3	58.8	3/13/31
CL32	New York Navy Yard					12/ 1/32
CL33	Beth. S.B. Corp. (Fore River)					8/15/32
CL34	Puget Sound Navy Yard					4/ 1/33
CL35	New York S.B. Co.	1.5	.8	.5		8/15/32
CL36	Philadelphia Navy Yard					9/ 1/33
FLEET SUBMARINES						
V-5 (SC1)	Portsmouth Navy Yard	87.6	86.7	84.	82.4	6/ 1/30
V-6 (SC2)	Mare Island Navy Yard	77.3	74.6	73.1	70.4	9/ 1/30

Authorized by Act of August 29, 1916.

12 Destroyers Nos. 348 to 359 inclusive—no funds for construction.
1 Transport No. 2—no funds for construction.
3 Fleet submarines Nos. 169 to 171 inclusive—to be undertaken in fiscal year 1930.
1 Neff submarine No. 108—no funds for construction.

Authorized by Act of February 13, 1929.

5 Light cruisers—to be undertaken in fiscal year 1930.
5 Light cruisers—to be undertaken in fiscal year 1931.
1 Aircraft carrier—to be undertaken in fiscal year 1930.

Admiral Byrd

New York *Times*, Dec. 13.—The promotion of Commander Richard E. Byrd to be a rear admiral on the retired list is a most fitting recognition of his exploits and services to science in the Antarctic. He has already been honored for his flight to the North Pole by being raised to the rank of commander and by the award of a Congressional Medal of Honor. The country will agree with Senator Swanson that his achievements "constitute the most remarkable combination of adventure and discovery in this age." It has been said that by President Hoover's signing of the act of Congress providing for the promotion of Commander Byrd he will become the youngest admiral on the retired list by seventeen years. The more distinction for the modest Virginian who carried the flag to the North Pole, flew the Atlantic, with a regular airship's crew, and, following the perilous track of Amundsen, was the first to reach by air the South Pole and return to his base in the Bay of Whales. "We are proud of your courage and leadership," was President Hoover's tribute to Commander Byrd. Colonel Lindbergh praised his organization as well in another message. The whole world applauded so splendid a feat, and scientific societies emphasized the contributions made to geographical discovery.

The daring explorer proved himself worthy of the highest reward that his country could bestow upon him. What an example he has set the junior officers of the Navy! At forty Byrd has become one of the greatest in the long list of polar explorers. There is no doubt that he has fired the imag-

ination of officers of the sea service in all nations, and Antarctic explorations by airplane will follow until the whole South Polar region is known and mapped and its resources determined.

It is now eighteen years since President Taft signed the act of Congress promoting and retiring Peary with the rank and pay of rear admiral. Peary's claim to the discovery of the North Pole was contested in Congress, and even line officers showed hostility to his advancement, notwithstanding his many expeditions for the glory of the service and the renown of his country. It is inspiring to recall how Admiral Sigsbee, representing what was best in the Navy, wrote: "You have made good, my dear Peary, and have brought immense prestige to our service. We can only be honored in our grade of rear admiral by your addition to our list." And so it may also be said of Byrd.

Panama Canal Traffic Makes New Record in 1929

Nautical Gazette, Dec. 14.—Traffic through the Panama Canal established new records during the fiscal year 1929, according to the annual official report, tolls collected being greater than in any previous year, and the tonnage of ships and commerce passing through it being greater than ever before. The net income, however, was smaller than in 1928.

Tolls on commercial ocean-going traffic amounted to $27,127,376.91 in 1929, while in 1928 the total was $26,944,499.77. This means a gain of $182,877.14 or 0.7 per cent. Including launches which paid $1,512.39 in 1929 and $1,109.34 in 1928, the grand total of tolls was $27,128,889.30 in 1929 and $26,945,609.11 in 1928, a difference of $183,280.19. Cargo carried through the Canal in the fiscal year 1929 aggregated 30,663,006 tons, a gain of 1,032,297 tons or 3.48 per cent over the 1928 record. The number of transits in ocean-going traffic totaled 6,413, compared with 6,456 in 1928, but in spite of this tolls were higher. The report says:

> The continued growth of traffic has emphasized the importance of a greater future traffic. It is planned to build a third flight of locks directly alongside the existing locks. No estimate has been made of the cost. A rough guess indicates it to be between $75,000,000 and $100,000,000, and that in the interest of economy it would be advisable to extend the construction period over ten years.

The net income from tolls and other miscellaneous receipts known as "canal revenue" was $17,729,775.01 for the fiscal year 1929, as compared with $18,224,844.86 for the fiscal year 1928, $15,611,093.80 for 1927, $15,151,668.06 for 1926, and $13,465,924.72 for 1925. The net profits of auxiliary business operations conducted directly by the Panama Canal, the most important of which are the mechanical shops, material storehouses, and fuel oil plants, totaled $737,850.26, as compared with $736,719.43 in 1928, $876,536.80 in 1927, $841,310.29 in 1926, and $765,916.85 in 1925.

GREAT BRITAIN

New Aircraft Carrier

London *Times,* Nov. 20.—The large cruiser, *Glorious,* which has been reconstructed as an aircraft carrier at Devonport Dockyard, is expected to be ready to commission on January 7 with a full engine-room complement and two-fifths upper-deck personnel for sea trials. She should be ready to complete to full crew on February 24, for service in the Mediterranean, where she is to relieve the *Courageous,* her sister-ship, the latter being transferred to the Atlantic. The *Glorious* is commanded by Captain D. F. Moir, D.S.O. Her completion will bring up the total of large carriers in the fleet air arm to six, of which the *Courageous* and *Furious* will be in the Atlantic, the *Eagle* and *Glorious* in the Mediterranean, the *Hermes* in China, and the *Argus* in reserve at Portsmouth. No further ship of the kind is likely to be completed for some time. It was proposed to lay down a new carrier in the current financial year, but the vessel was struck out of the program.

Lords Attack Plan to Cut British Navy

New York *Times,* Dec. 19.—Earl Beatty, who commanded the British Grand Fleet during the latter part of the World War and until his retirement in 1927 was First Sea Lord, warned the House of Lords today that the British situation in regard to cruisers was "indeed serious" and urged that twenty-six cruisers be laid down within the next ten years.

Earl Stanhope, former Civil Lord of the Admiralty, had asked the government whether, in consequence of the reduction announced in the number of cruisers to be

maintained, the Admiralty has been relieved in any way of its responsibilities for defense and whether the cruisers so reduced will be taken from those allotted to the battle fleets or from those guarding trade routes. Since the end of the World War, said Earl Stanhope, the policy of successive British governments has been one solely for defense and the preservation of peace. He said:

> This policy had been for the defense of the whole empire and to carry out this policy experts have consistently recommended, among other things, seventy cruisers. These cruisers included ships belonging to the dominions' navies and also ten ships over age.
>
> A recent announcement, apparently authoritative, however, made it appear that a position was reached where Britain would be content with fifteen 8-inch gun cruisers of roughly 10,000 tons and thirty-five cruisers of approximately 6,500 tons each and carrying 6-inch guns. This made a total of fifty cruisers instead of seventy.
>
> Does this include the ships belonging to the dominions and those which Britain can retain though they have reached the age limit?

A reduction of twenty cruisers from seventy, said Earl Stanhope, would either mean reducing the thirty-three cruisers on the trade routes to thirteen or practically taking away all cruisers allotted to the battle fleet.

Earl Beatty said this was not a political or a party matter, but an imperial question. He said:

> The responsibility of the admiralty is to provide a naval strength adequate to carry out the government's policy and protect our sea communications, trade routes and dominions and colonies from oversea attack. This responsibility is not only to the British government but to the empire, and it is for that reason we are concerned to know what has been done, what is being done or will be done at the forthcoming parley in London which would in any way weaken the hands of the admiralty in carrying out that heavy burden.

Earl Beatty held that the cruiser question with which the conference would deal was vital "because with cruisers the defense of Britain's trade routes and sea communications is primarily concerned." He continued:

> On any average day there are 95,000,000 tons of British shipping to be found on lines of communication extending over 80,000 miles. The smallest number of cruisers required to work with the battle fleet was assessed at Washington at twenty-five and could not be altered in any circumstances. Today we have fifty-nine cruisers built or building, and that does not include the 1928 program, which was suspended, or the 1929 program, regarding which, as far as the public is aware, nothing has been done. To maintain the number at fifty within the next ten years we must lay down twenty-six new cruisers.

Earl Beatty added that Britain had dropped her number of cruisers from seventy to fifty and was entering the forthcoming conference with "an extremely low limit of cruiser tonnage." At the same time, he said, there was no present indication that proper provision was being made, even with the reduced figures and the tonnage which had been put down. Earl Beatty asked:

> Is it surprising that there is apprehension among those who have given thought to this vital question, and that there should be dismay among those who cannot understand how parity in cruisers can be arrived at unless it is to be a parity having regard to the commitments and obligations of each nation?

There is no nation, Earl Beatty declared, whose naval commitments and obligations are so great and so complicated as the British Empire's.

> It is inconceivable that there should be anyone opposed to arriving at an agreement with the United States or any other nation. It is equally inconceivable that anybody will lose sight of the fact that the empire is one whose communications are the sea, and it is on the protection of the sea that it depends.

On behalf of the government, Lord Thomson, Minister of Air, assured the Lords that the policy of the government, so far as the empire is concerned, had not altered a single point. He said:

> That policy is to provide security for the empire in all its aspects, and any suspicion that the government acted without consulting the board of the Admiralty is entirely unfounded. What we are putting first at the naval parley is policy, and the government feels absolutely confident that the Admiralty will be able to continue adequately to discharge its responsibilities for naval defense.

Lord Thomson said it was impossible to deal in the figures asked for. He believed that two Australian cruisers were included in the figure of fifty.

Earl Stanhope urged the government to take the country into its confidence before entering the conference, and with that the matter dropped.

FRANCE

Cruiser Design

Naval and Military Record, Nov. 20.—The 10,000-ton *Duplex*, that has been officially laid down by Minister Georges Leygues at Brest, is the sixth cruiser of the Washington standard, and very likely the last. The type no longer answers France's

defensive requirements on the water. The leading admirals of the Conseil Superieur, Admirals Violette, Pirot, and others, are in favor of bona fide fighting ships, that is *capables d'encaisser,* capable of taking at the same time as giving. Ships of 14,000 tons at full cruising load, mounting long-range guns of 8-inch bore, but at the same time so deficient in armor as to be vulnerable to the new 5-inch shells (130-mil.), appear to many as a faulty compromise. No doubt a battery of eight 203-mil. weapons, the power of which is much superior to the 210-mil. guns arming von Spee's cruisers, may be justly considered, if well handled, as constituting an efficient defense, even the best defense. *La puissance du feu est la meilleure defense* is ever a true motto. *Faits nouveaux,* unfortunately, are to be reckoned with that alter natural conditions of visibility and tend to depreciate the value of range in the artillery duels of tomorrow. Artificial clouds, especially the new light-colored mists, experimented upon in the German maneuvers in the Baltic and elsewhere, will, in skillful, well-trained hands enable 6- and 5-inch batteries being employed with deadly effect, even at 10,000 yards, against unarmored hulls offering so wide a target as the elongated 10,000-ton cruisers do. It must not be forgotten that since the war the ballistic science has made progress. The effective range claimed for the new French guns is surprising; and without, outwardly, claiming anything, the Germans are known to be at least as advanced. In the course of experiments the 155-mil. weapons arming our 8,000-ton cruisers have thrown shells at distances of about 26,000 yards. At ranges of 15,000-17,000 meters the accuracy of the 50-kilo. projectiles is satisfactory. Penetration is being combined with exploding power.

It is now felt that that universal 10,000-ton Washington standard cruiser (thin skin, long-legged greyhound or weak-hearted boxer) has been a gross mistake, especially since Germany, suddenly emerging from nothingness into preëminence, has produced with nominally the same displacement a true fighting type designed to knock infinitely harder blows (with shells thrice as heavy) and at the same time withstand with impunity considerable punishment. The *Ersatz Preussen* against a *Tourville* or a *London* would be in a situation superior to that which the British *Invincible* enjoyed in her victorious duel with the *Scharnhorst.* The German 11,000-ton armored cruisers faced the music for hours, but one or two 340-kilo. shells would be sufficient to account for Washington treaty cruisers, the rôle of which in the contests of tomorrow will come down to that of destroyers of destroyers, of scouts, or of commerce destroyers. So, much money is wasted on secondary issues.

If such be the prevailing view among French experts why, then, lay down another 10,000-ton cruiser? Because it is better than nothing; the money has been voted by the Chambers; and if not used (as has been the case for the first aviation credits) it would be lost to the Navy; and the plans of the future cruisers of the marine française are not quite ready. Further experiments are necessary. The cost will be different. There are in preparation alternative designs intended to meet the new situation, disquieting for France, arising from the revival of German sea power, and also from the imperialistic policy pursued by Mussolini. Meanwhile the *Dupleix* has been defensively improved and will rank among the best protected Washington cruisers.

ITALY

Delegation to Five-Power Conference

Baltimore *Sun,* Dec. 9.—The Italian delegation to the five-power naval conference in London next month, unless there are eleventh-hour changes, will be composed of Foreign Minister Grandi, Admiral Sirianni, Minister of the Navy, Admiral Acton, who participated in the Washington Naval Conference, and Ambassador Bordanaro, whose post is at London.

There will be numerous advisers and experts, among them Minister Plenipotentiary Augusto Rosso, formerly counselor of the Washington embassy, and Captain Ruspoli, who also participated in the Washington Conference.

MERCHANT MARINE

The Shipping Tangle

Marine Journal, Dec. 2.—The more the latest shipping proposal of Mr. Hoover's interdepartmental committee is studied, the more of a mystery it becomes. Ostensibly a plan to promote American shipping and, in particular, to make possible immediate construction on a large scale, it makes such

impossible demands of American shipowners as to block all progress for an indefinite period.

The North Atlantic mail demands now put forward in the name of the Post-office Department would be laughable if they were not tragic. The United States Lines met all the building demands of the Shipping Board when it bought its fleet and went them four ships better. That is to say, Mr. Chapman's company agreed to build forthwith not only two 27-knot superliners but four 20-knot, 30,000-ton cabin boats of superior type.

Here was a balanced and sane building program, surpassing the best of any rival line of any other nation. Such a fleet could be operated economically and successfully and the fine operating success to date of the United States Lines gave every promise that it would be so operated.

But the interdepartmental committee is not satisfied with the Shipping Board's contract or with a fleet skillfully planned from the point of view of successful operation. It demands three superliners instead of two and also a fleet of four 18-knot, 12,000-ton liners, of limited value for either postal, passenger, or freight purposes. It increases the required tonnage to be built from roughly, 220,000 to 320,000 tons.

The fleet of four great liners, which it insists upon, has no parallel in any existing or projected fleet anywhere else in the world. The plan treats the *Leviathan* as certain to become obsolete in six years—which would be after twenty-two years of service. Yet the *Mauretania,* at twenty-two years, is today beating all her records and treading on the heels of the marvelous *Bremen.* What earthly value the 18-knot boats would be to the Post-office Department is an equal mystery.

We cannot believe that this extraordinary demand represents the final policy of Mr. Hoover's administration. The United States Lines bought its ships at a price more than double that of the nearest bid that conformed to specifications. It has operated its fleet with striking success. It is prepared to build forthwith—at a time when prompt building means everything to the resuscitation of business confidence. Yet, because of a blundering Congressional enactment, the whole future of this brave American attempt to build a great American fleet in the North Atlantic, the most highly competitive shipping field in the world, is compromised. Worse, it is muddled in a maze of interdepartmental politics plus proposed Congressional action which can tie up all progress indefinitely.

The Republican party is committed to the development of the merchant marine as its established policy. The defense of the nation, the whole problem of naval limitation, the future commerce of the nation, is involved in our merchant shipping. We know that Mr. Hoover has the problem profoundly at heart. We shall still hope that some way can be found to cut through the present tangle and start the immediate building of these great ships by the only American line possessing the strength and the shipping wisdom to operate them successfully in competition with the world.

Large Ocean Liners

The Engineer, Nov. 22.—Twelve months ago the newspapers were teeming with reports of the impending construction of mammoth lines for the Western Ocean service. We seemed to be on the eve of an international competition for the "blue riband" of the Atlantic transcending in magnitude and intensity all previous contests of this kind. Public interest was stirred by the vision of a whole fleet of monster ships setting out to establish new records for the ocean crossing. In a few years, it was confidently affirmed, even the mighty *Majestic* and *Leviathan* would be relegated to secondary rank, and the best steaming performances of the *Mauretania* left far behind. These expectations, however, are not yet within sight of fulfillment. As regards progress in big liner construction the present year has been singularly blank. No superships has been laid down in Europe or America, nor does it seem likely that any will be started in the immediate future. It is true that plans exist for over a dozen great liners, British, Continental, and American, but the mere fact that a ship has been designed is no guarantee that she will be built. The only event of positive importance which has happened this year is the completion and maiden voyage of the Norddeutscher Lloyd liner *Bremen.* Her sister, the *Europa,* it will be recalled, was so severely damaged by fire at Hamburg last March that she will not be ready for service before the spring or summer of 1930. The *Bremen* sailed on her

maiden voyage in July, and reached the Ambrose Channel lightship off New York after a run of 4 days, 17 hours, 42 minutes from Cherbourg breakwater. This ocean passage of 3,096 nautical miles at a mean speed of 27.83 knots was the fastest that had ever been made. On her return trip the *Bremen* did even better, crossing from New York to Plymouth at an average speed of 27.9 knots. In none of her later voyages has she equalled this performance, but it is not unlikely that she may create new records when her machinery has been thoroughly bedded down and "run in." Although any suggestion of a race has been disclaimed both by the Norddeutscher Lloyd and the Cunard people, it was a coincidence that, a few days after the *Bremen's* performance, the *Mauretania* should have steamed across the Atlantic in shorter time than she had ever done during her twenty-one years of service. Leaving Southampton on August 3 she reached New York in 4 days, 22 hours, 44 minutes, having steamed the whole distance at an average speed of 26.85 knots. For twenty-four hours she maintained a mean of 27.48 knots, in spite of unfavorable weather. This extraordinary feat has not unnaturally suggested to the public that the old veteran still has a knot or two in reserve, and may even yet beat her young German rival. But, as Sir A. F. Yarrow pointed out in a recent letter to the press, it is not fair to compare a vessel over twenty years old with one newly built, especially when the latter has an advantage of 160 feet in length and is fitted with water-tube boilers, as against the old-fashioned cylindrical boilers of the Cunarder. In our opinion, the *Mauretania* has done all, and far more than all, that could reasonably be expected of her, and there is, we fear, no chance of her recapturing the "blue riband." If our shipowners attach any importance to the possession of that trophy, they must be prepared to build new ships which would incorporate, to an even greater degree than the *Bremen*, the latest developments in hull design and propelling machinery.

Considering what our shipbuilders and marine engineers have accomplished in the past, there can be no question of their ability to turn out new record-breaking ocean liners. The fact that such vessels have yet to go afloat is due entirely to economic considerations. The laws of demand and supply apply just as much to shipowning as to any other branch of business. Ships of such outstanding size and speed as the *Mauretania*, and *Lusitania*, the German *Imperator* class, and, more recently, the *Bremen* and *Europa*, were built in response to a definite demand. In every case they replaced vessels which were no longer equal to the requirements of the passenger traffic for which their respective owners catered. At the present time, however, the principal British liner companies do not, apparently, see any immediate necessity for the construction of very large and very fast ships. Their existing fleets, we understand, proved quite adequate to deal with the traffic requirements of the past season, and the appreciable decline in the number of first-class passengers on the cross-Atlantic route, as compared with last year's figures, is scarcely an inducement to embark on costly programs of new construction. The slump in big liner construction is just as evident abroad as at home. In this country all work has been suspended on the White Star vessel *Oceanic*, of 60,000 tons, since her keel plates were laid at Belfast in June, 1928. The company, it is understood, is still considering alternative methods of propulsion, but in view of Lord Kylsant's public statements there is little doubt that the vessel will be equipped with either oil-electric or turbo-electric drive. It is possible that the designers have taken advantage of the delay to touch up the original plans, in which case the new *Oceanic* may turn out to be an even more imposing ship than had been anticipated. This month there has come an official denial from one of the Cunard directors that his company had contracted with well-known firms in the North for two large liners. On the other hand, there has been no contradiction of the report that the Cunard Line has in view the building of vessels which are likely to establish new standards of tonnage and speed. Turning to other countries, there is still no news of the laying-down of the Cie. Générale Transatlantique liner, which was reported last summer to have been ordered from the famous yard at St. Nazaire. She is to be larger than the *Bremen*, and a contract speed of 27 knots has been mentioned. In Italy the Navigazione Générale Italiana and the Lloyd Sabaudo have each in prospect a 50,000-ton ship faster than the *Bremen*, but so far neither vessel has been

started. On the other side of the Atlantic the Chapman Company, which purchased the *Leviathan* and other units of the United States Lines, are inviting tenders for two 30,000-ton ships of 24-25 knots. These comparatively unambitious ships are to be built before the two super *Leviathans* of 55,000 tons, which would appear to have been shelved for the present. It is certainly not a fortuitous circumstance that the building of all the very large liners projected last year has been postponed. We have already alluded to this year's serious shrinkage in first-class passenger traffic, but there are other considerations which cannot have failed to weigh with the liner companies. Despite the fact that in recent years the number of first-class passengers annually carried across the Western Ocean has been about 100,000 less than the prewar average, the total tonnage of the vessels plying on this route today is only slightly less than the total in 1913-14. It would seem, therefore, that the supply has outrun the demand. There is always a section of the traveling public which is ready to pay high fares for the privilege of rapid sea transport, but whether such people are numerous enough to justify the building in the near future of a whole series of very fast ships is exceedingly doubtful. Added to the formidable first cost—which in the case of a 60,000-ton, 28-knot ship might be as much as £4,000,000—the operating charges are necessarily very high. The *Bremen*, for instance, is said to consume 6,000 tons of fuel oil on each round trip. Harbor and dock dues constitute another serious item in the bill. So onerous are these charges at New York that the Cie. Générale Transatlantique is seriously considering the choice of an alternative terminal on the North American seaboard. While there is natural jubilation in German shipping circles at the splendid performance of the *Bremen*, doubts are being freely expressed as to whether this ship and her sister will prove a sound investment. It is significant that the Hamburg-Amerika Line, which is second to none in experience and enterprise, has definitely decided against the building of fast liners. The directors of the company, it has been intimated, consider that ships of medium tonnage and speed, combining comfortable accommodation with moderate fares, are better adapted to present-day requirements.

Taking as we do a professional interest in the advancement of shipbuilding and marine engineering, we cherish the hope that economic conditions may soon improve to the extent of warranting the construction of some, if not all, of the great liners which are known to have been designed at home and abroad. The launching of ships which will eclipse the *Bremen* as completely as the *Mauretania*, twenty-two years ago, eclipsed all other aspirants for the ocean-speed trophy, is merely a matter of time. Writing in no spirit of national prejudice, but simply from knowledge of current progress in naval architecture and engineering, we do not hesitate to predict that Britain's next great ocean liners will worthily uphold the traditions of the twin industries, which exemplify, in a peculiar degree, the mechanical genius of our race.

AVIATION

Giant Planes of the Near Future

Baltimore *Sun*, Dec. 15.—Airplanes two or three times as large as the huge Dornier *DO-X*, which flew with 169 passengers over Lake Constance, are not only feasible but structurally less difficult than the transport airplane now being built.

This is the expert opinion of Dr. Claude Dornier, designer and builder of the world's largest airplane. Dr. Dornier arrived in New York recently to confer with executives of General Motors and Fokker Aircraft Corporation regarding the construction of his flying boats in America. The Dornier Corporation of America was incorporated in Delaware last month by General Motors Corporation and Fokker Aircraft Corporation of America.

"It will be easier to build a large boat than it was to construct the *DO-X*," said the famous designer in a chat with aviation experts soon after his arrival.

It is exactly like building a steel steamship. As the size is increased the sheathing of the flying boat is made thicker and weight-saving becomes simpler, relatively speaking.

For instance in the *DO-X* we used nine rivets to every two pounds of spar weight, compared with forty-four rivets for every two pounds of spar weight in the two-engined Dornier Wal.

Dr. Dornier revealed that he had already laid down on the drawing board designs for a flying boat which would have a gross weight of 80 tons compared to 52 of the *DO-X*. He plans to power the huge pro-

jected ship with nine engines of 1,000 horsepower each, developing 9,000 horsepower, compared with 6,000 horsepower of the *DO-X*.

"The limiting factor in the creation of large airplanes right now is the factor of power," Dr. Dornier told the aviation experts. "We want a satisfactory motor developing a thousand horsepower. We will get it eventually."

The famous German designer said he probably would fly the *DO-X* to America next summer, making the trip by way of South America. Dr. Dornier said:

> America, with its large cities conveniently located on fine waterways, offers the best field for the large flying boat. A ship of the size of the *DO-X* could be used to advantage between New York and Miami Beach, between the great cities of the Great Lakes region and along America's large inland waterways.

Dr. Dornier will be consultant of the Dornier Corporation of America and in that capacity will spend a great deal of time in this country. With General Motors and Fokker executives he is at present engaged in consideration of several sites for the first factory for the construction of Dornier flying boats. He said he expected that several of the American-built Dorniers would be completed within the next year.

Sidelights on the Schneider Contest

The Aëroplane, Nov. 20.—On November 15 Squadron Leader A. H. Orlebar, A.F.C., gave a lecture at the R.A.F. Station Cinema, Cranwell, on the contest for the Schneider trophy. The lecture was illustrated by lantern slides and a short cinema film. In addition to the commandant, officers, civilian staff, cadets, and airmen of the Cadets' Wing, Cranwell, the audience included the commandant of the Royal Military Academy, Woolwich, and the rugger and soccer teams from Woolwich who were playing Cranwell teams the following day.

A good deal of the information contained in Squadron Leader Orlebar's extremely interesting lecture has already been published in this and other journals, but one or two points are of interest.

Describing the training of the pilots selected for the team, the lecturer said when they were appointed to the high speed flight none of them, with the exception of Flight Lieutenant Greig, had ever flown seaplanes. They had started training with a dual-control seaplane, and had then gone onto flycatchers with floats. From that they had gone onto the high-speed practice machines.

Except for taking off and alighting, flying high-speed machines was very much like any other sort of flying. The first stage in taking off was rather unpleasant, especially if the sea was not very calm, as the machine pitched about and very often water was thrown back over the fuselage and a good deal of it went down the back of the pilot's neck. The second stage when the machine was up on the step was quite pleasant.

With regard to the personal training of the pilots, nobody knew much about training high-speed pilots, and they had taken things in a fairly free and easy manner. They had knocked off alcohol, which was not very difficult as three of them were teetotalers anyhow and the others did not care either way, and they had cut down smoking to a minimum, again not very difficult as three of them were non-smokers. They had taken ordinary exercise and had kept away from the sheds when there was no flying on. They had refused offers of massage.

Describing the delay in the arrival of the competing machines he said that delay in these affairs could be easily understood. They were built to specifications which were continually being altered and amended. Naturally the designers would go on adding power and taking away weight until somebody at the Air Ministry, somebody very brave, called a halt. The Supermarine S.6 had proved very different from anything else they had flown because of its high-powered and low-geared engine. He described the various difficulties and trials with the new machines and how they had been overcome.

He had originally intended that each pilot in the flight should try out every machine and then make his own choice, but in the end that had been impossible. Waghorn and Atcherley had definitely wanted S.6s, Stainforth had wanted a Gloster, and Greig had been neutral. So Stainforth and Greig had been allotted Glosters with the S.5 as a second string for Greig.

Interesting experiments on turns had been made while they were at Calshot. First of all they had flown over a *camera-obscura*, and after that they had done timed and measured turns over a spit of land. They had then drawn up a mean average between

the time lost on a sharply banked turn and the time lost in covering more ground on a flatter turn.

Their experience had been that the problem of the pilot "blacking-out" on a sharp turn was not a serious one. A medical theory that black-out followed the loss of other faculties was not supported by their experience because they had found that in every case the pilot became normal again on resuming level flight and did not at any time lose consciousness. Stainforth was not subject to black-out at any time, to which might be due his reputation for having a cast-iron inside.

Describing the crisis which had arisen on the evening before the race when one of the Supermarine S.6 machines had been found to have a fragment of metal on one of the plugs caused by the scoring of the inside of one of the cylinders, the Lecturer said that the mechanics from the Rolls-Royce Company had already been working for four days and four nights without rest except for an odd hour's sleep now and again, and were in no condition to tackle such a tremendous job that night. With the help of the police a party of mechanics from the works at Derby, who were staying in and around Southampton to see the race, were raked up and brought to Calshot.

They immediately got down to the tremendous job of changing a cylinder block at night and with the engine in the machine, a job which had never been attempted before. Everything was ready one hour before it was time for the machine to be taken out for the race.

Large Metal Dirigible Planned

Aviation, Nov. 23.—The Detroit Aircraft Corporation, through Edward S. Evans, president, has announced plans for a 100-ton, 50-passenger metal-clad dirigible, engineered and constructed similar to the metal-clad *ZMC-2,* recently delivered to the United States Navy. Although no date for starting construction was made known, it was announced that designing work on the larger craft was well under way.

According to the details revealed here, the proposed all-metal airship will rank as the fourth largest lighter-than-air craft in the world, being surpassed only by the *Graf Zeppelin,* the British *R-101,* and the airship being built for the U. S. Navy at Akron. The present design gives it a length of 520 feet, a diameter of 115 feet, and a gas capacity of 3,250,000 cubic feet.

Those figures will give the commercial metal-clad a much higher ratio of fineness than has the same corporation's *ZMC-2.* Roughly, its size will be two and one-half times the size of the *ZMC-2* and its gross lift sixteen times that of its predecessor. A total of 4,800 horsepower is expected to give the ship a high speed of 100 m.p.h. and a cruising range of approximately 2,000 miles.

It is also estimated that the new dirigible can be completed within two years after start of construction. Just where this construction will take place was not revealed. Part of a statement issued by Dr. Evans coincident with the announcement follows:

> This size is not recommended because it is impracticable from the standpoint of present experience to build larger metal-clads; larger sizes are entirely feasible but better judgment favors this 100-ton ship as a conservative choice. Furthermore, it is the frank and firm opinion of those responsible for the metal-clad development, that any large rigid airship built within the next five or six years, no matter for what purpose and by whom built, is an experiment.
>
> Actual experience with the *ZMC-2* shows conclusively that the metal seams hold gas almost perfectly even when subject to extreme variations in temperature. The total leakage, including seams, averages about one-third the leakage, through goldbeater skin gas cells. There is also practically no deterioration of the gas due to back diffusion of air.

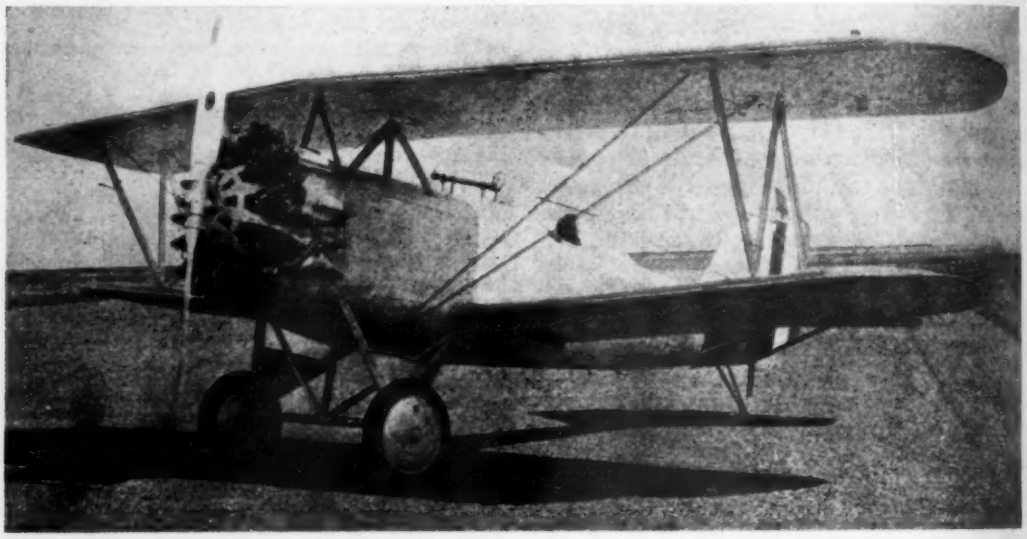
The "XFH"—Single-Seat Fighter

Aviation, Nov. 30.—In order to meet the demand of the Navy Department for a shipboard fighter embodying the principle of emergency flotation and other safety features, the Hall-Aluminum Aircraft Corporation, Buffalo, N.Y., has developed the *XFH-1.* This design, which was worked out in coöperation with the Bureau of Aeronautics, was recently completed, and has been undergoing a series of test flights. The *XFH-1* is a single-seat biplane of conventional arrangement for this type of service, but having a number of noteworthy constructional features. Another interesting feature in addition to the water-tight fuselage is a means of quickly dropping the landing gear in the event of a forced descent on the water.

The *XFH-1* is powered with a Pratt & Whitney Wasp engine and complete military equipment is included in the installation. The airplane has a wing span of 32 feet, an over-

all length of 22 feet 6½ inches and an extreme height of 9 feet 3 inches. The weight empty is 1,755 pounds and the gross weight 2,514 pounds. The structure is built entirely of metal, aluminum alloy being used in all principal parts. Wings and tail surfaces are covered with fabric. The general type of construction is the result of a number of years research by Charles Ward and Archibald M. Hall, and is used by certain other manufacturers. Several characteristics are noted in this design as well as in the general methods of construction adopted. Among these are the wide use of sheet-metal stock and drawn section members, and the success with which accessibility for riveting has been obtained. Ingenuity also is shown in obtaining concentric loading and balancing out secondary stresses in the structure.

A considerable saving in weight is effected in this design due to the careful proportioning of the individual members. This saving is not attributable alone to the substitution of aluminum alloy for the more usual forms of construction but is the result of thorough consideration of all principal structural members with the object of eliminating unnecessary material wherever possible. The principal members have been designed to resist stress maxima to which they may be subjected in service and, what is more important, even the smallest details in the design of the airplane have been given the same consideration.



THE HALL *XFH-1* SHIPBOARD FIGHTER POWERED WITH A PRATT AND WHITNEY WASP ENGINE

The Human Factor in Flying

Aviation, Dec. 14.—By J. B. Culemans. Educational psychologists suggest three interlocking ways in which the flight instructor transfers his education to others. They enumerate: ideational factors, attitudinal factors, and attention factors. Or, in more familiar terms, through the mind, the will, and the memory, trained in turn and together, he fashions new pilots.

"Ideational factors" include a thorough understanding of every part of plane and engine, its functions, and the reason why it functions correctly or wrongly. Ideational factors lay the foundation for the others to build upon. They need to be stressed very much, singly and in their interrelation. From an endless series of examples, just one may be adduced as an illustration. The possibility of a stall is present in every take-off in every maneuver, in every landing. It must be emphasized in its various causes, consequences and remedies. As these are drilled into the student's mind, some one detail may be crowded out by others that gain temporary supremacy. Only gradually will the

different items become organized by the mind into a consistent whole. The training of the mind is dependent upon, and goes apace with the training of eye and ear, and to some extent of the general muscular system. They act at one with the mind, as for instance, in the judgment of speed, or distance. The one temptation for the instructor to guard against is, to take for granted that, what is familiar, simple and easy to him, is therefore equally familiar to the pupil.

The mind may become so thoroughly absorbed in its own activities as to leave no room for "attitudinal factors" to get in their coöperative work. A sluggish will reaction is fatal. Quick coördination of will and mind is essential. The will, in turn, reacts on the muscles, innervating them to elicit the correct bodily motions of arms and legs. This coördination again must become so perfect as to seem automatic under the most varying circumstances. Time for reflection and deliberation is seldom at the pilot's disposal, least of all in an emergency. In that case the will is also called upon to dominate and repress fear, that warps judgment, prevents clear thinking and acting and leads to a serious accident. It may not be amiss here to mention the fear that is the direct result of clear judgment, and dissuades from taking unnecessary chances: a strong will should stand firm against all taunting and false pride.

The accumulated experience of mind and will interplay is stored in the memory against future requirements. "Attention factors" therefore are called upon to resurrect and apply whatever lies quiescent in the depths of consciousness. Association of ideas plays a large part in rousing dormant powers, as, and when they are needed. A quick and adequate response to a stimulus, such as a skid or a fierce gust of wind, is a guarantee that the mind, the will, and the human mechanism function together in reliable manner to meet unexpected demands. In the long run all three factors must merge into one and operate as a unit. The failure of one of them at a critical moment generally spells disaster.

The more or less minute dissecting of the various psychological factors at work in training, may seem far-fetched. Yet they are at work, if unconsciously, in every individual. The better they are understood and deliberately acted upon step by step, the more thorough the result will be.

The instructor having transferred his knowledge to the pupil, the latter is judged to have acquired habits, skills and ideals which he must henceforth make functional on his own account. A perfect "feel of the plane" should enable him to run it while his mind is presently busy with other problems, such as charting his course, checking his instruments, or receiving communications over the radio. To this extent habit and skill are a test of past intelligence or knowledge.

But it should be borne in mind that habit is not always and necessarily a test of present intelligence. A number of animals may be trained to execute certain maneuvers with almost infallible precision: that is hardly a test of the animal's intelligence, but rather of the trainer's intelligence. For the animal is easily tripped and does not adapt itself to changing circumstances. A real transfer of knowledge involves the extension and the application of ideas to new problems, new situations, new emergencies, in such a manner that man can deal with them instantly and effectively. To the pilot this fact is of extreme importance, since it is of such frequent occurrence. He is constantly called upon to check, or redirect or change his habitual train of acts. Expertness and reliability are put to the test in meeting the new situation or the new combination of circumstances. In such cases automatic habits may clash with one another and lead to disaster. Or, they may coöperate with one another under the direction of an active mind and save a desperate situation. The quick transfer of habitual knowledge to actual operation distinguishes the good pilot from the poor one. The phlegmatic type, who flies by rule of thumb, is likely to detect the danger and to attempt a correction when it is too late. The high-strung, excitable type is likely under the stress of the moment, to ignore carefully built-up habits, and by overcontrol defeat his own purpose.

Sensing danger and forestalling it, whether it be in connection with the plane, the weather, the terrain, or the public, is a psychological attitude clamoring for cultivation. Prudence is still the best part of valor. The commercial pilot, who is to inspire confidence and win the diffident masses for air travel on a large scale, must impose upon himself the strictest inhibitions, and repress

all desire to prove what the plane and himself are capable of in the way of hair-raising thrills. Whatever some individual pilot may think, they do not win prospective passengers to trust themselves *en masse* to the airplane as a regular vehicle of transportation. And it is the mental reaction of the public that counts in the long run, in aviation as in any other business.

Psychology has come to play a large part in the business world. Age and experience have won promotion for the great business executive, for the captain of liner or battleship, for the commanding general. Age has given them the benefit of a long trial and error experience, resulting in the balance of judgment which is their greatest asset.

Youth and experience are required in a pilot. Youth is an asset, in his case, that is well-nigh indispensable. It also has drawbacks that are as undeniable as they are sometimes lightly brushed aside. These, psychology can help him master to a large extent if he can be convinced that a trial and error experience is more fatal to him and to the cause he represents, than to any business or to any executive.

Automatic Pilot for Planes of British Royal Air Force

Aviation, Dec. 14.—The recent fog flying experiments of the Guggenheim Fund have drawn attention to the British position, and the Air Ministry has permitted public reference to the pilot's assistor, as it is called, which is now being standardized upon Royal Air Force aircraft.

It has been developed by the Royal Aircraft Establishment over a period of years, and is now officially declared capable of controlling a plane far more precisely than the skilled human pilot. It works equally well with a two seater, a heavy night bomber, or a twin-engined flying boat. The exact details of the device have not been made public, but the basic principle is the use of a gyroscope to maintain level stable flight. This is driven by compressed air supplied by a wind driven compressor and compressed air is used to operate pistons linked to the ailerons, rudder, and elevators. It is said to be capable of correcting variations of a fraction of a degree from the set course. The pilot can at any moment take over control by turning a tap which cuts off the power from the controls and, should this ever fail, there is an emergency pin in the pipe line which pulled out at once releases all pressure.

A very large amount of experimental work has been carried out on the apparatus before its adoption, and test flights of 400 miles have been made without the pilot once touching the controls. The first squadron to be fitted with the new device is one of Vickers Virginia night bombers, machines weighing eight tons. It is only a question of production before most other units will have the device. The military advantages are self-evident for it means that in cloud flying or rough weather the pilot is relieved of much physical and mental fatigue, a distinct advantage.

Details of Plane Parachutes

The New York *Herald Tribune*, Dec. 22.—Parachutes large enough to lower a crippled plane to the ground, several of which have proved successful in experiments, may soon become standard equipment for mail and passenger planes. One of the leading parachute companies will be ready to equip air lines with them in about six months.

Captain Roscoe Turner, commercial aviator, landed a plane with one of the large parachutes at Santa Ana, Calif., last spring. His test was not wholly successful, as the landing gear of the Thunderbird plane was demolished when the ship struck the ground. On the other hand, when a pilot is forced to desert his plane and resort to the ordinary type of parachute it results in the wrecking of the ship.

The parachute used by Captain Turner, and by Carl Osle for an earlier test, is the invention of J. M. Russell, of the Russell Parachute Company, which is about to start production of the parachutes at its plant in San Diego.

Working on a parachute that had to be fifty or sixty feet in diameter, Russell found that the greatest difficulty was in getting such a large piece of silk to open out after it was released. The device that he perfected to overcome this difficulty is a series of valves.

The parachute has three rings of valves, or vents, in the fabric, one in a circle around the top, another several feet below the first and a third about half way between the lower edge of the silk and the center of the parachute. When it is released the air forces the first series of vents to open. The para-

chute is filled, not from underneath as in the case of the small instrument but through its sides.

As soon as enough air has accumulated in the top of the parachute it forces the valves shut from inside, when the second series opens, brings in more air which closes them, and the third series operates in a similar manner. The parachute requires about five seconds to fill with air.

A parachute fifty feet in diameter is large enough to support a plane that carries three or four persons. A thirty-passenger plane, Russell believes, can be supported in a parachute ninety feet in diameter. The plane is fastened to the parachute by four lines from different points in the fuselage, holding the plane steady.

The cost of a parachute large enough for a thirty-passenger plane would be about $3,500. This would be less expensive, however, than providing separate parachutes for each passenger. Most operators believe it unwise to provide individual parachutes, even aside from the question of expense, as they give rise to fear among passengers. The large parachute, which would not be seen by the passengers would have no such effect.

The parachute is carried in a cylinder above the fuselage. It can be released instantly by the moving of a lever. In case of a fire the parachute could be released, freeing the pilot and other members of the crew from the controls so that they could fight the fire, which would be easier to control when the wind stream from the propeller had stopped.

Adaptation of Diesel Principle to Aircraft Engines

New York *Times*, Dec. 22.—With the successful test flying of the new Junkers heavy oil-burning motor, the engineers of that company say they have overcome most of the difficulties of the adaptation of the Diesel principle to aircraft engines and have solved the current problem of constructing power plants large enough to facilitate the construction of large airplanes.

The new motor, a modified model of the old HK stationary Diesel, is the result of many years of experiment. This motor was capable of construction in units much larger than other types of Diesel. If the same principle can be applied to the adapted form for aircraft, it may solve a problem which has retarded the construction of larger aircraft, the present range of building reliable engines being limited to those of about 600 horsepower.

The new Junkers is of unusual design. It has two opposed pistons in each cylinder, two sets of crank throws and two crankshafts, both of which are reciprocal and connected with the drive shaft of the propeller. Valve mechanisms are replaced by the use of ports and the adoption of the two-cycle principle.

A description of the cycle of impulse in the engine is as follows: The air is forced into the cylinder as one of the pistons uncovers a slot or port at the end of its stroke. The air is taken in through a combination air cleaner and single-phase centrifugal blower. The two pistons then close in on each other and, as the maximum heat and compression points are reached, a small quantity of heavy oil is injected, creating the spontaneous combustion and starting the power stroke. As the stroke ends, the opposite piston uncovers another port and the burned gases pass out of the chamber, and the cycle is repeated.

The advantages of this type of construction are outlined in the report of the Junkers engineers received by the Department of Commerce. Heat control is carried to a fine point through the division of the stroke between the two pistons. Torque is lessened by the application of power from opposed sources and scavenging—always a problem in the construction of heavy oil-burning engines—is facilitated by the single direction of the air stream passing through the motor.

The elimination in weight of magnetos, valve assemblies, cylinder heads, and other essential parts of the convention four-cycle engine is said to be greater than that added by the installation of the second crankshaft and piston assembly.

The present model is to be known as the Junkers SL-1, and it is known that others are on the way, all built on the same principle. The engines are started by compressed air, and reports of some of the test flights say that the reaction of the SL-1 to changes in speed is faster than that of gasoline engines of corresponding power.

Long Range Aerial Photographs

Aero Digest, Dec.—Long-distance aerial photographs recently made by the Army Air

Corps are expected to produce important data relating to the curvature of light rays around the surface of the earth, according to a recent announcement of the War Department. The work done in connection with making the photographs is also expected to develop methods of long-distance photography which will prove of value in time of war, the War Department stated.

The photographs were made during the past summer on a 14,000-mile aerial photographic tour of the northwestern part of the United States made by Captain Albert W. Stevens, chief of the aerial photographic unit of the matériél division, Wright Field, Dayton, Ohio, with Lieutenant John D. Corkville of the Army Air Corps as pilot. The fliers put in more than 140 hours of flying time on the trip. A photograph of Mount Ranier was taken from a distance of 227 miles at an altitude of 17,000 feet above a landmark which could be identified on a map. Photographs of Mount Ranier were also obtained from a distance of 214 miles. In the 227-mile photograph mountains far beyond the eye's range were clearly visible.

The photographs were made on film sensitive to the invisible infra-red rays that penetrate smoke and haze. In the picture, Mount Ranier appeared lower than the other mountains in the foreground because of the curving of the earth's surface, although in reality it is higher. The photographer could not see the objective and was obliged to point the camera in the direction of Mount Ranier and await the development of the film to view the result.

The camera used in making the photographs of Mount Ranier was an Army K-6, using an Eastman 500 mm. focal length lens, kryptocyanine hypersensitized film, and red filter. The airplane used in making the photographs was a CO-8 DeHavilland fitted with Loening amphibion wings and powered with a Liberty engine.

Pratt and Whitney Wasp Junior Engine

Aero Digest, Dec.—A new 300-horsepower, nine-cylinder, air-cooled, radial aircraft engine known as the "Wasp Junior," has been extensively tested and will be put on the market soon. This step marks a radical departure from the policy of the Pratt & Whitney Company, which since its inception four years ago has devoted all of its energies to the high-powered aircraft engine field.

The new model, which is of 985 cubic inches displacement, weighs 550 pounds and is 45¾ inches overall in diameter. It is essentially the Wasp engine with a new power section and its rated power is delivered at 300 horsepower at 2,000 revolutions per minute. It has an equal bore and stroke of 5-3/16 inches.

The new engine was brought out to meet the requirements for an engine of this size, having the dependability and long life that have made the Wasp and Hornet engines internationally famous. It incorporates all of the features of the Wasp and Hornet and by standardization of design, 80 per cent of the parts are interchangeable. Even the mounting dimensions are identical. Due to the use of so many of the tried and proved parts of the Wasp engine, none of the difficulties usually encountered in bringing out a new model have been experienced, and it is expected it will equal the enviable record for reliability and performance attained by the Wasp and Hornet, which between them have established twelve world's records for speed, range and endurance, which covers practically the entire field of airplane performance.

Types of planes which will be able to utilize the Wasp Junior will include among others the four- and five-passenger cabin planes, the two- and three-place open commercial planes of high performance characteristics, the light cargo carrier used on feeder lines, the smaller sport amphibion, and trimotored transports of the smaller type. The Wasp Junior is also expected to have an interesting military and naval application for small high performance aircraft.

It is an interesting fact that the use of the Wasp parts has caused but little increase in weight. In addition to being geometrically similar, the same materials are used and the same material control and care in manufacture are exercised as in the Wasp.

Due to the use of standard rear crank-case section, the engine has the same mounting circle as the Wasp which should prove a very valuable feature to the airplane manufacturer who desires both a 300- and a 420-horsepower engine. Like the Wasp and the Hornet, the Wasp Junior is available with propeller reduction gears.

ENGINEERING AND RADIO

The Use of Pulverized Coal in Internal-Combustion Engines

Marine Engineer and Motorship Builder, Dec.—As is well known, the possibility of using pulverized coal directly in the cylinders of an internal-combustion engine was conceived and tested by Diesel at the end of the last century. Diesel established the possibility but encountered such practical difficulties that this direction of progress had to be abandoned and the more immediately promising use of oil developed.

Since Diesel's time much, however, has been learned concerning the better pulverization of coal, and recently the original work of Diesel has been continued by Pawlikowski and a fairly successful pulverized coal engine developed. The engine was originally an 80-B.H.P. single-cylinder M.A.N. single-acting four-stroke cycle Diesel. It was converted to burn coal in 1916. The space between the piston rings was supplied with air at 60 atmospheres pressure; and at a compression pressure of 30 atmospheres and explosion pressure of 40 atmospheres, no dust, ash or carbonizing of the rings occurred. Thus was the greatest difficulty met with by Diesel entirely avoided. The engine ran from 1916 to 1924 without renewal of piston rings, the cylinder liner wear being only 2 mm. After now having been running some 8,000 working hours, with a cylinder wear of 5 mm. only, the piston rings have been recently renewed.

The three decisive factors for the successful running of the internal-combustion engines are oxygen supply, temperature and fuel surface. Comparing Pawlikowski's engine with Diesel's in the light of these factors, it is at once evident that the former's success is due to the introduction of air through the piston rings. This air prevents the entry of dust and ash through the rings. It also increases the oxygen supply. This assistance was not available to Diesel. Both engines were able to fire the charge. The pulverization of the coal in Diesel's day was not a commercial operation. Today, however, pulverized coal can be bought and of a fineness which results in a much greater combustion surface than was possible with the coarse pulverization available to Diesel. This increased surface greatly improves the fuel combustion.

Pawlikowski himself has published no data as to the behaviour of different grades of pulverization. Lange, however, has investigated the ignition temperatures of various coal dust and his work is discussed by the author, together with further work on the subject carried out by the author himself. This work emphasizes the necessity of high oxygen supply and the finest possible pulverization to prevent coking. Excessive oxygen supply, however, may be as disastrous as insufficient and the amount must be varied with the nature of the coal as evidenced by its ignition range.

Shop Trials of Largest French-Built Diesel Engine

Marine Engineer and Motorship Builder, Dec.—Towards the end of October the trials took place at the Saint-Denis, Paris, works of the Compagnie de Construction Mécanique Procédés Sulzer of the first of the two Sulzer-type two-stroke cycle, single acting, engines ordered by the Société des Services Contractuels des Messageries Maritimes for the motor liner *Félix-Roussel.* This vessel is under construction at the Saint-Nazaire yards of the Ateliers et Chantiers de la Loire, and is expected to be launched during the present month. The two engines have each ten cylinders, and are rated to develop 7,000 I.H.P. each, being similar to those fitted on the Dutch liner *Christiaan-Huygens* The trials of the first of these engines were highly satisfactory, and were attended by a number of French shipping and shipbuilding personalities. This is the largest Diesel engine so far turned out in France. The *Félix-Roussel* is designed to have a speed of 18 knots on trial, and a service speed of 16 knots.

Ship-to-Shore Telephony

The Engineer, Dec. 13.—A few days ago a ship-to-shore telephone service was officially opened to the public, and conversations were held between persons in New York, Washington, and Atlantic City and other persons on the liner *Leviathan,* 250 miles out at sea. From his office at 195 Broadway, Mr. Walter S. Gifford, president of the American Telephone and Telegraph

Company, called up Commodore H. A. Cunningham, commander of the *Leviathan,* with practically no more delay than is experienced in establishing communication with an ordinary telephone subscriber, and at both ends the voices of the speakers were clearly heard. About twenty persons listened to the conversation, and some of them held conversations of their own. The circuit was then shifted to Washington, and Mr. Britton, Chairman of the House of Representatives Committee on Naval Affairs, had a talk with Commodore Cunningham. Afterwards Mr. William H. Rankin, one of the guests at a hotel at Atlantic City, talked with Sir Thomas Lipton, who was a passenger in the liner. On the ship all the talking was at first done from a room on "B" deck, but ultimately the telephone service was connected with all the staterooms. It is expected to be possible, when atmospherics are absent, to hold conversations with a ship as far as 1,500 miles from the shore. A message has already been sent over 800 miles.

Naval Radio Stations to Use New Code for Time Signals

New York *Times,* Dec. 29.—A new time signal code, which is a modification of that recommended by the Time Signal Board, has been approved by the Chief of Naval Operations. The United States Naval Observatory is at the present time making plans for the modification of all time clocks to take care of this change. When this work has been completed, the new code will be sent out from all naval radio stations broadcasting time signals. To modify and reinstall the clocks will probably take several months.

The Jesuit Observatory at Manila has also been requested to adopt this same code for broadcasting time signals from the Naval Radio Station at Cavite, P.I. In this way only one code will be used for the broadcasting of time signals from all naval radio stations.

With the new code, the time signal begins five minutes before the hour to be marked and consists of a dot for each second. The dot for the twenty-ninth, fifty-sixth, fifty-seventh, fifty-eighth, and fifty-ninth second of each minute is omitted and also the following: Fifty-first of the first minute, fifty-second of the second, fifty-third of the third, fifty-fourth of the fourth, and the fifty-first, fifty-second, fifty-third, fifty-fourth, and fifty-fifth of the fifth. The silence after the fiftieth second of the fifth minute is followed by a one-second dash, the beginning of which marks the time signal. In this code, the number of dots between the two omissions at the end of each minute indicates at once the number of minutes of signal yet to be sent, and it is also believed that the shortened interval before the one-second dash will make possible more accurate comparisons of the final one-second dash.

MISCELLANEOUS

The Reaction from Size

Naval and Military Record, Dec. 4.—By Herbert Russell.—Some little time ago in these columns I expressed the view that there is a growing tendency on the part of naval officers to consider the needs of the country not in terms of the biggest ships, but of the smallest ships which can be regarded as adequate to the fulfillment of their functions. This has brought me a letter from a naval officer of my acquaintance who is at present serving in the Outer Seas, and asking me whether I have "taken into account the conditions which have resulted in the production of very big displacements?" I rather gather that he thinks the growth of the warship has been a natural process of evolution. I do not think it has been anything of the kind. The very big warship is the legacy of that long period of international competition which just now, fortunately, has been curbed by the Washington agreement, and for current political reasons, has died down. No sooner did A build the "last word" in warship design than B went one better, a process which inevitably involved going one bigger. Underlying this rivalry was the stereotyped maxim about "building a ship to beat any enemy." Up to the extreme point of practical limitations this is undeniably a sound principle. But it long since passed that extreme point. The capital ship of today represents a most extravagant concatenation of surplus energy. She illustrates how competition becomes merely unreasoning. She can shoot 20 miles. Nobody wants to shoot 20 miles. Naval battles can only be fought within visible limits; any artificial attempts to project a conflict beyond visible limits will mean shooting the contents of the magazines into the sea. But for the Washington agreement we should now, in all probability, be

well on the way to shooting 40 miles. It is perfectly feasible—and perfectly useless.

Competition has been the curse of naval design—an inevitable curse only to be scotched by international agreement. The incessant reminder that it is man who directs matter seems to me to be irrelevant. Man wants the best weapons. He is not going to be reconciled to inferior weapons by being told that he may attain victory by superior skill in using them. No amount of skill or gallantry is going to make an outranged and outpaced warship a match for her opponent. If my neighbor opposite happens to be a person of primitive instincts and I know he has purchased a pistol with a range of 100 yards for the purpose of potting at me at the first favorable chance, I should ask a gunsmith for a pistol with a range of 120 yards, so that I might at least have a chance to begin potting first. But if this neighborly preparation continued, I think I should be satisfied when I had got to the stage of a weapon that would shoot a mile. I should not spend any more money if I knew that my neighbor had purchased a gun that would shoot a league. In other words, I feel that a mile would represent more than the maximum of effective range for a small-arms duel, and that anything beyond that would be a wasted potentiality of destruction.

Apply this rather elementary image to the capital ship. We were carried to the climax of big displacements by an inherent distaste for anything savoring of reaction. We must have a hull of a certain size in order to carry guns of a certain size with an adequate degree of armor. No single feature in modern warship construction has improved so steadily as the gun. The 8-inch gun of today outranges by 60 per cent the 12-inch gun of twenty-five years ago. We have not been satisfied to keep to a given maximum of caliber and let the evolutionary process of improvement do the rest. We have ignored the development of the individual gun and gone from something bigger to something still bigger. Displacement has had to chase the swelling gun in a series of prodigious leaps. What on earth we wanted a 16-inch gun in the two *Nelsons* for, when the gunnery experts of the Navy, with but few exceptions, hold that the 15-inch gun was already too big, goodness only knows! Competition again, I suppose; the Americans have a 16-inch gun. Personally, I should like to see the Americans mount a 20-inch gun: it would be the *reductio ad absurdum* of their present policy in the matter of sea power.

Whilst the gun is not the only factor in determining size, it is certainly the principal one. The Germans, who have taught us a good many things, are now offering us another interesting demonstration. At the outset of the war they disconcerted us very much by showing that they could get as much out of a 4.1-inch gun as we were getting out of a 6-inch gun. Now they are going to prove that a hull of 10,000 tons standard displacement can mount six 11-inch guns and that these 11-inch guns are equal in range to our 15-inch guns—in fact, I rather suspect that they will prove more than equal. And so the primary argument for the colossal ship crashes. True, the colossal ship is heavily armored and the little German ship is not. I do not think any naval designer today will be found to admit that broadside armor justifies its heavy demand for increased displacement. It would have been practicable to armor our *Kents* of 12,300 tons (old displacement) much more effectively than the *Cressys* of 12,000 tons, but the price involved in curtailment of gun powder and cruising radius ruled out the idea. Yet in the *Cressys* it was thought worth while to pay that price. Otherwise these useful ships would have been in every other respect equally useful on considerably smaller displacement.

I think we shall see the day when the guiding principle of naval construction is to produce a vessel armed only to the limit of practicable fighting range. Our new 8-inch gun is credited with an extreme range of 29,000 yards. Will anybody deny that this does not more than represent the limit of practicable fighting range? More than sixteen and one-half land miles is a span across which shooting is only possible with the aid of aerial spotting, and, with all due respect to our highly-efficient air observers, aerial spotting in a running naval action will prove a level alternative to dumping ammunition over the side without taking the trouble to fire it away at all. This, at any rate, is the opinion expressed to me by gunnery people who may be assumed to know what they are talking about. So that we come to the proposition that the 8-inch gun represents more than the limit of practicable fighting range. Why, then, mount anything heavier?

The obvious answer is that the 16-inch projectile will do so very much more damage than the 8-inch shell. Granted! But the question is whether the 8-inch shell will not do quite enough damage against the type of ship which the adoption of the 8-inch gun as a maximum weapon would presently result in. We have cried halt to the silly game propounded by the old problem of the irresistible shot and the immovable post. We want to consider how far we may swing back without denying to our fighting men the most effective weapons. With an 8-inch gun shooting 29,000 yards they are in no danger of being outranged. At a distance of 29,000 yards a ship is only visible to her water line from an altitude of 130 feet. How often does visibility at sea give such an horizon? And, when it does, a smoke screen, and in a few minutes the distant target has vanished.

The Admiralty have already disclosed their view of this question. Two years ago they proposed a maximum displacement of 25,000 tons for capital ships, with an armament of 15.5-inch guns as the limit. They are substituting 6,000-ton cruisers with 6-inch guns for 10,000-ton cruisers with 8-inch guns which they are free to build. There is little doubt, I think, that the Admiralty would be prepared to go considerably further in reaction from mere size. For is it not reasonable to take the view that reduction of naval armaments need not mean simply reduction in numbers? Indeed, if applied to reduction of size of ships the necessity for diminishing total numbers may be very greatly, possibly entirely, obviated. How far international agreement may work to this end remains to be seen. France and Italy already favor what I would term a "little ship policy." Japan, I think, would not be averse to it. The United States leads us to suppose that she will have none of it. How this might react upon Japan I cannot pretend to say. I do not think it need influence the European powers, which really take very small positive interest in the American Navy.

If we are going to reduce armaments, it clearly becomes a sheer anomaly to contemplate the perpetuation of the colossal capital ship, costing about eight millions, and concentrating in herself much too large a space of total tonnage. To admit this is virtually to constitute a starting point for considering how far reaction in dimensions may be carried. It may be argued as unreasonable to assume that any one power is voluntarily going to build small ships and expose them to the risk of having to meet the big ships of another power. But I think the reaction would prove general—save probably in the case of America—by common consent. Just as the big ship is the result of competition, so would the smaller ship be the result of example. And, as the Germans are demonstrating, quite a lot can be done to make the small ship a pretty formidable customer. The *Ersatz Preussen* could face the prospect of an action with an *Iron Duke* without any feeling of forlorn hope. She could hit the *Iron Duke* at any range up to which the *Iron Duke* could hit her, and this is the first consideration in an engagement. Inability to compass it spelt Cradock's defeat at Coronel and von Spee's defeat at the Falklands. I think I may claim not to be merely following others in my thesis. Twenty-five years ago, when the *King Edwards* represented our last word, I wrote in *The Morning Post* "A Plea for Smaller Battleships," and an admiral, then in active command, wrote to me: "I must admit I find your contentions very difficult to refute." Since then circumstances have taken charge and swept us on to monster ships and monster weapons. Now the naval powers are showing a strong disposition to take charge of circumstances. The course of the next few years will, in my humble opinion, prove very momentous in the history of naval construction. When the *Rodney* and *Nelson* were laid down I predicted that they would be the last great capital ships to be built in this country, and I was honored by considerable derision from certain scribes who flourish chiefly on contradicting other people, having nothing much else to write about themselves. I now take the liberty of repeating that prediction, and somehow I do not fancy I shall be quite so much honored in the same way.

NOTES ON INTERNATIONAL AFFAIRS

From December 3 to January 3

Prepared by Professor Allan Westcott, U. S. Naval Academy

DISTURBANCES IN HAITI

Another Investigating Commission.—Labor unrest and rioting in Haiti early in December occasioned the sending of 500 Marines to reënforce the 700 then on the island, and called forth a special message from President Hoover to Congress, which requested authorization and appropriation for a commission to investigate conditions relating to the American occupation. The recent trouble is stated to have had its origin in a student strike at the Daimen Agricultural School upon a slight reduction of its allowances. Fanned by political agitators, the disturbances spread to the customs service and to workers in other government departments. Martial law was declared on December 4. After quiet had apparently been restored, the first bloodshed occurred at Aux Cayes on December 6, when a detachment of twenty marines were compelled to fire into a mob of some 1,500 natives, armed with clubs and field tools, to prevent their forcing an entry into the town. Five Haitians were killed and twenty wounded.

To prevent smuggling of arms the cruiser *Galveston* was sent to Jacmel, Haiti, where she arrived on December 8. At that date conditions were reported quiet throughout the island.

American Occupation of Haiti.—The Foreign Policy Association devotes a special number of its *Information Service* (November 27-December 12) to "The American Occupation of Haiti," giving a detailed account of political, financial, and economic problems on the island, especially since American intervention in 1915. The survey seeks to maintain a nonpartisan attitude, and closes with a statement of what it considers the four possible policies for the future: (1) Immediate termination of the treaty and withdrawal, on the ground that the American occupation, while resulting in material improvements, has made the Haitians even less capable of self-rule; (2) continuation of present methods and withdrawal upon the expiration of the present agreement in May, 1936; (3) radical modification of present methods by removal of marines, substitution of civilian for military control, and renewal of elections; (4) indefinite occupation, to be assured by a new treaty when the present one expires, on the ground that the Haitian people will require a long period of training before they can govern themselves. Decision as to future policy will be the primary task of the proposed committee of investigation.

LONDON NAVAL CONFERENCE

French Delegates and Policy.—The French delegation to the London Naval Conference, as announced at the close of December, included Premier Tardieu, Foreign Minister Briand, Minister of Marine Georges Leygues, and Colonial Minister François Pietrie, together with two Senators, four Deputies, and a corps of naval and legal advisers. Great interest was taken in preliminary statements of the French position and policies, the feeling being that France was most likely to prove a disturbing element in the conference. In a note to the other participating powers on December 26, France made it very clear that she feared being rushed into an agreement in

a conference dominated by England and America, that she intended to maintain her present building program, and that she would insist that the work of the conference should be regarded as strictly subservient to the general movement for arms limitation under the auspices of the League of Nations. By shifting ultimate decisions to Geneva, France feels that she would gain by the participation of the smaller nations, would be able to coördinate naval reductions with limitation of air and land armaments, and would be able to connect the whole matter of arms limitation with the problem of security. The fundamental principles of the French note were stated in the New York *Times* as follows:

First—The agreements at the London conference are to be within and subservient to the framework of the League of Nations' general disarmament plans.

Second—That the Kellogg Pact, while a real step toward the preservation of peace, nevertheless is being based upon the force of public opinion and cannot be regarded in its present state as a guarantee of the security of nations.

Third—French naval needs must be established upon the very considerable requirements of the "French empire" and not upon the mathematical ratios as set forth by the Washington conference.

Fourth—Definite French proposals for a Mediterranean naval accord similar in construction to the already existing treaties for the Pacific and the Black Sea, the accord to include Great Britain, Italy, France, and Spain.

Japanese Delegation in Washington.—En route to London the Japanese naval delegation headed by former Premier Reijiro Wakatsuki stopped in Washington in mid-December for conferences with the American delegation. Little appeared from the reports of these conferences save the familiar knowledge that Japan would insist on the retention of the submarine and a 7-10 instead of a 6-10 ratio in auxiliary craft, while willing to negotiate as to the distribution of her 70 per cent tonnage among the various types of auxiliaries. The following statement was issued to the press:

1. Having the conference fix the global or total tonnage for each nation in auxiliary ships of war—cruisers, destroyers, and submarines—but with the modification that the number of tons of ships of each of these three classes would be fixed.

2. That if the United States be allotted twenty-one or eighteen cruisers of 10,000 tons each, as against fifteen for Britain, Japan will urge that she is entitled in 10,000-ton cruisers to 70 per cent of the highest number.

3. That her problem being wholly defensive and believing that submarines as well as 10,000-ton cruisers are defensive weapons, Japan wishes the conference to determine upon some limitation of the whole tonnage to be allotted to each nation, leaving to each nation the determination of the tonnage of the submarines to be built within the total tonnage allotted.

4. That while Japan, in a general way, desires to have 70 per cent of the auxiliary warship tonnage of the strongest naval power, she will be willing to take less than a 70 per cent allotment of one or another class of auxiliary ships, say in destroyers, if the deducted part of that percentage could be added to another auxiliary class, say to cruisers or submarines, but especially submarines.

5. That according to the interpretation placed on Mr. Wakatsuki's answers, Japan considers submarines necessary for her national defense and is not in sympathy with the desire of the United States and Britain to abolish submarines as weapons of naval warfare.

6. That the abolition of battleships would suit Japan if there were any prospect of it at the London conference.

7. That Japan does not expect at London to raise the question of abandonment of Britain's Singapore naval base and is not definitely informed as to whether Britain will retain it, but if the base is retained it should be considered as part of the naval strength of Britain.

No Neutrals in Wartime.—Explaining its signature of the optional clause of the World Court statute, granting to the court compulsory jurisdiction of all justiciable disputes between co-signatories, the British Foreign Office issued a White Paper in December aiming to show that British sea rights were not jeopardized by the action.

The line of argument was that "as regards states which are members of the League of Nations and parties to the Kellogg Pact" all future wars are likely to be regarded as offenses against the obligations assumed and thus against all other nations. Hence "as between members of the League there can be no neutral rights, because there can be no neutrals." The White Paper was careful not to extend this statement to include all signatories of the Kellogg Pact; but American critics at once resented even the implication that our obligations under the pact might force the United States out of a neutral position. Secretary Stimson in a statement on December 30 pointed out that the "no-neutral" argument of the White Paper applied only to League members.

It was later stated in Washington dispatches that efforts had been abandoned to make the Kellogg Pact the basis for proposed naval agreements in London, in spite of the fact that it had figured largely in all

preliminary correspondence. And on December 23 Premier MacDonald gave assurance in the House of Commons that agreements in the conference would deal only with questions of naval *strength* and not with questions of naval *policy*.

FAR EAST

CHINA ENDS EXTRATERRITORIALITY. — The Nationalist government in China on December 28 issued an order declaring that "on and after January 1, 1930, all foreign nationals in China now enjoying extraterritoriality shall be subject to Chinese jurisdiction." Executive and judicial departments were further directed to prepare the means to execute this mandate. As a popular move, designed to reëstablish the prestige of the Nanking government after its unfortunate experience in Manchuria, this action was by no means surprising, but it was not expected that the major powers would accept the unilateral action of China as binding, or that the decree would be put into immediate practical effect. In previous negotiations the United States has stood firmly on the ground that surrender of extraterritorial rights must be a gradual process, proportionate to the progress of China toward a strong central government and modernized judicial procedure.

Subsequent correspondence published by the British Foreign Office indicated that England had offered China a most acceptable "face saving" opportunity by declaring that January 1 might be "treated as the date from which the gradual abolition of extraterritoriality should be regarded as having commenced in principle," but insisting that there must be negotiations as to methods and program before abolition in reality. This is also the view of the United States State Department.

At the Kyoto conference of Pacific nations last October the question was under discussion and a solution appeared quite possible which would gratify the Chinese demand for complete sovereignty while still providing adequate legal protection for foreigners. It was foreseen, however, that if no early action were taken, China would be quite likely to precipitate the question as she has now done.

REBELLION AGAIN OVERCOME.—Early in December another of the constantly recurring waves of rebellion swept over China, and from all press reports the country appeared in a condition closer to complete anarchy than ever before. Mutiny broke out among troops in the vicinity of Nanking; a circular telegram denouncing President Chiang Kai-shek and signed by thirty-nine "generals" was issued at Peking; General Chang Fa-kwei was again reported as advancing on Canton; everywhere there was almost complete stoppage of rail and telegraphic communication. Despite this dark situation, President Chiang Kai-shek was able within a fortnight to declare with some semblance of truth that the rebellion—"the greatest yet experienced"—had been overcome, and that the Nanking government was stronger than before. Bribery, persuasion, superior munitions supply, and preponderance of aircraft each played a part in maintenance of the Nanking rule.

OPERATING THE KELLOGG PACT

SECRETARY STIMSON'S NOTE.—Ever since the general acceptance of the Kellogg-Briand Peace Pact, there has been much curiosity to see how it would work—if at all—to prevent war, or bring two contending nations to terms. The Manchurian situation was unquestionably one in which the pact should go into operation, if it were not to become a dead letter. Both the Soviet Republic and China were signatories; and, though neither had declared war, hostilities on an extensive scale were actually going on. Secretary Stimson of the American State Department recognized that if no action were taken in this emergency, it would become increasingly difficult to appeal to the pact at any future time. Accordingly, though perhaps belatedly, he consulted others of the chief powers and on December 3 sent a note both to China and the Soviet Republic calling attention to their obligations under the treaty, and at the same time appealing to other signatories to take similar action. Great Britain, France and Italy, with several smaller nations, complied with the American suggestion. Germany refrained because of her special relations with the disputing parties, while Japan took no action on the ground that it was unnecessary and might endanger the direct negotiations already begun.

Judgment as to the results of the experiment ranged all the way from ridicule of the

protest as a belated and ineffective gesture, to the belief expressed in other quarters that it had actually helped toward a peaceful solution.

MOSCOW'S REPLY.—While the reply of China to the American and British notes was most conciliatory, the Soviet response, handed to the French ambassador for transmission, was something quite different. M. Litvinoff, Soviet Acting Commissary of Foreign Affairs, declared that the notes, sent while direct negotiations were in progress, could not but be considered "unjustifiable pressure on the negotiations" and could not therefore "be taken as a friendly act." In a subsequent speech before representatives of the press and diplomatic corps he said that a genuine desire for peace would have prompted much earlier protests when China violated her agreement, and he drew invidious comparisons between the one Soviet "punitive raid" and the presence of troops and naval vessels of other powers "permanently stationed" in China.

While Secretary Stimson made no direct reply to the Soviet note, he issued the following statement in the press:

I have seen the text of the Russian memorandum as reported in the press.

Between co-signatories of the pact of Paris it can never be rightly thought unfriendly that one nation calls to the attention of another its obligations or the dangers of peace which from time to time arise.

As far back as The Hague convention of 1899, the nations of the world agreed that strangers to a dispute, on their own initiative, could make suggestions looking for peace between the states which were at variance and that the exercise of that right is not to be regarded by the parties in conflict as an unfriendly act. This was reaffirmed again in 1907 and has been the recognized rule ever since.

The message of the American government was sent not from unfriendly motives, but because this government regards the pact of Paris as a covenant which has profoundly modified the attitude of the world toward peace and because this government intends to shape its own policy accordingly.

In the language of the joint statement issued by the President of the United States and the Prime Minister of Great Britain on October 10 last, "both our governments resolve to accept the peace pact not only as a declaration of good intentions but as a positive obligation to direct national policy in accordance with its pledge."

The present declaration of the authorities of Russia that they are now proceeding with direct negotiations which will make possible settlement of the conflict is not the least significant evidence to show that the public opinion of the world is a live factor which can be promptly mobilized and which has become a factor of prime importance in the solution of the problems and controversies which may arise between nations.

MANCHURIAN PEACE TERMS.—Direct negotiations between the Soviet and Manchurian authorities, which were already in progress early in December, resulted in a proctocol signed at Khabarovsk, Siberia, on December 22, in which Manchuria gave practically complete consent to the Soviet demand for restoration of the *status quo* in regard to the Chinese Eastern Railway on the basis of the agreements of 1924. Provision was made for a definite conference to open at Moscow on January 25. Both Soviet and Chinese rail employees were to be restored to their positions, nationals of each were to be released from arrest, troops were to be recalled, concessions and privileges restored, and white guard leaders and organizers were to be expelled by the Chinese from Manchuria.

UNITED STATES AND EUROPE

FRENCH DEBT ACCORD RATIFIED.—On December 18, President Hoover signed the bill, previously passed by Congress, ratifying the Mellen-Berenger agreement for funding the French debt to the United States Government. The agreement, which was ratified by the French Government last summer, provides for settlement of the debt of about $4,000,000,000 by payments spread over sixty-two years with interest at 2.17 per cent.

GERMAN-AMERICAN DEBT ACCORD.—A new debt agreement between Germany and the United States, necessitated by the shift from the Dawes plan to the Young plan for the settlement of Germany's war indebtedness, was concluded at the close of December. The agreement provides for payments to be made directly to the United States government, and not through the proposed Bank of International Settlement. The amounts paid will be used for settlement (1) of claims allowed to American citizens by the German-American Mixed Claim Commission, (2) of remaining amounts due on the cost of the American Army of Occupation.

At the time of the debt accord it was announced that the German delegates to the second Hague Reparations Conference in January would be Foreign Minister Curtius, Finance Minister Moldenhauer, Minister of Economics Robert Schmidt, and former Chancellor Wirth, now Minister of the Occupied Area. Some fears were expressed regarding the strength of the delegation, considering that it included neither Chancellor Mueller nor Germany's most noted financial expert Dr. Hjalmar Schacht.

WORLD COURT PROTOCOLS SIGNED.—With authorization from President Hoover, the American Chargé d'Affaires in Switzerland on December 9 signed the three protocols which, when ratified, will make the United States a participant in the Permanent Court of International Justice. These protocols have still to be approved by four nations who are members of the court (Albania, Costa Rica, Ethiopia, and Lithuania) and also by the United States Senate. In the Senate the protocols are certain to encounter delay and opposition, but it is believed that the final action will probably be favorable.

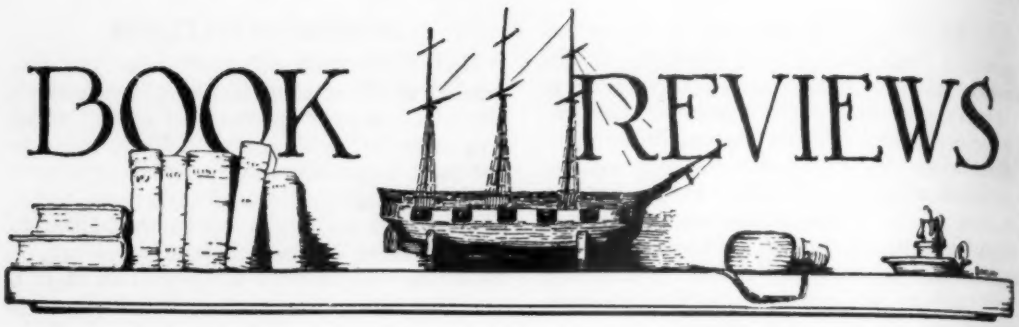
The President's letter of authorization, dated November 21, included a long statement by Secretary Stimson aiming to show that the Senate reservations regarding American entry into the court are fully met by the "Root formula," embodied in the agreement now proposed.

EUROPEAN NATIONS

RUSSO-TURKISH TREATY.—In mid-December the Soviet and Turkish governments signed a two-year "protocol of amity" which was regarded in the press as likely to prove the most important international agreement since the Kellogg Pact. While described in Moscow as a "peace agreement directed against none," foreign observers were inclined to link it with the pronounced leftward swing in Soviet internal policy and to see in it a revival of Soviet interest in Moslem and Near Eastern affairs.

NEW PRESIDENT OF GREECE.—The first President of the Greek Republic, Admiral Paul Koundouriotis, resigned in December for reasons of age and ill health, after occupying the presidency since the expulsion of King George II in 1923. To fill the vacancy, the Greek Parliament elected M. Alexander Zaimis, former Premier and loyal supporter of present Premier Venizelos.

GERMANS DEFEAT "LIBERTY LAW."—The German vote on Sunday, December 22, on the proposed Nationalist "Liberty Law" condemning the Young Plan, resulted in only about 6,000,000 votes in favor of the measure, whereas at least half of the total German electorate of 41,500,000 was necessary for its approval. The result proved that efforts to defeat the financial settlement by appeal to the "war guilt" issue had made little popular appeal.



BOOK DEPARTMENT

Members of the Institute may save money by ordering books through its Book Department, which will supply any obtainable book. A discount of 10 per cent is allowed on books published by the Institute, and 5 per cent on books of other publishers (government publications excepted). Address Secretary-Treasurer, U. S. Naval Institute, Annapolis, Maryland.

MERCHANTMEN-AT-ARMS. By David W. Bone. (Illustrated by Muirhead Bone.) 2d Edition. New York: E. P. Dutton & Co., Inc. 1929. $5.00.

REVIEWED BY INSTRUCTOR RICHARD S. WEST, JR., *U. S. Naval Academy*

The even temper of this book makes it a curiosity, for it was written by a merchant captain in the period of greatest submarine menace, from 1917 to the surrender of the German undersea arms at Harwich on November 20, 1918. During most of this time David W. Bone, the author, commanded huge army transports, and was in an intimate position for observing British and Allied naval operations. In addition, H. M. Tomlinson, noted writer on nautical subjects, contributes a roseate introduction, and Muirhead Bone lends a brotherly hand with a series of interesting illustrative sketches.

But somehow Captain Bone's book is disappointing. In form it is a series of very laborious essays—twenty-two of them—and they suffer from being too well organized. The author tries to cover so much ground that he loses sight of details, which are the life of any story about the World War. Nowadays one seeks such frank and intimate revelations as *My Mystery Ships* or *On The Bottom*, but in *Merchantmen-At-Arms* these new insights are all too rare. Once or twice the chapter-essay relates a concrete incident; and when this is true, as in "The Man-O'-War's 'Er 'Usband," the author steps down from the bridge to the wardroom and tells a good story with the proverbial sea flavor. At other times Captain Bone's narrative reveals a wealth of historical and cultural background which sometimes serves to tide us over the dull stretches, and sometimes fails. Chapter IV is one of the good exceptions, being a fine account of the connection of merchant mariners with the state in early times. Few readers will forget the description of how one great landed nobleman opposed the establishment of lighthouses and ports of refuge on the ground that "wrecks on the coast belonged to him and formed a considerable part of his property!"

SECRETS OF ESPIONAGE. By Winfried Lüdecke. Philadelphia: J. B. Lippincott Company. 1929. $2.50.

REVIEWED BY BROCKHOLST LIVINGSTON

One almost tires of reading repetitions of the old accounts of Mata-Hari, Lody, Trebitsch-Lincoln, and the multitude of other famous spies whose fame has been gained only at the price of failure in their chosen "calling." However, the present author presents his subject from apparently first-hand information and, because of his intimate knowledge, we are compelled, with the rest of his readers, to speculate as to his identity. Because of the new angle from which we see many of the known episodes of espionage, this book has its interesting features. It cannot be recommended as a literary masterpiece for its construction is often not of the best. If we are satisfied to look at it

only from the viewpoint of its subject matter, it is well worth the few hours consumed in reading it.

The volume seems to have been written for its English readers (it was first published in London) for it showers almost undue praise on the British Intelligence Service, while at the same time depreciating the skill of the continental organizations. While we all appreciate the worth of the British "institution," we must feel that the French agents, especially, have been slighted.

As we read through the pages of Lüdecke's book, we are struck with the number of tenets expounded. Among other things, we are told that sentiment is a dangerous pastime for the secret agent, that we should be wary of Japanese messmen for they may also be naval officers of their country in disguise, and that consuls and diplomats should refrain from espionage for their own or other nations if they wish to remain in the good graces of the governments to which they may be accredited. Examples of all these are given us to impress the importance of adhering to such doctrine. We further learn that women spies are not favored by the British, and we wonder, in this connection, which sex is more prone to sentiment.

If the book has one point above others in its favor, it is the omission of the story that Mata-Hari faced the firing squad at Vincennes clothed only in her sable wrap. It may be a perfectly legitimate claim for a fictionist like Temple Thurston but it is beyond the scope of one who treats the subject seriously—and Lüdecke has, we believe, done that.

WHEN THE U-BOATS CAME TO AMERICA. By William Bell Clark. Boston: Little, Brown and Co. 1929. $3.00

REVIEWED BY DIANA LIVINGSTON

Mr. Clark has achieved a gripping account of the activities of the German submarines off the American coast, beginning with the visit of the *U-151* in 1918, and concluding with the raid of the *U-152* in September of the last year of the war.

This book was written for the layman, to whom Mr. Clark transports, in intimate guise, Publication No. 1, Historical Section, U.S.N., *German Submarine Activities on the Atlantic Coast of the United States and Canada*. For this reason Mr. Clark might have been more guarded in his criticism of the Navy's handling of antisubmarine work on the American coast. However, it may have been his intention to direct his attack against only the war-time secretary rather than against the service as a body. Furthermore, criticism of one's government is like criticism of one's family: it may be the vogue but by so doing you fall a peg in the estimation of your audience. The American public chooses its representatives. Therefore, bringing to light their shortcomings indicates its own bad judgment in choosing.

Abounding, as the book does, in instances of rare courage and heroism, the Navy militant retrieves its reputation before the 312th page has been reached. After all, this is the guilt-edged *amende honorable* because, while the author's criticism is open to comment, the heroism is fact beyond argument.

To me, personally, Mr. Clark's book was interesting in the light it shed upon certain events which came to my notice while I lived in Barbados. (Barbados, by the way, is an island, and not "The Barbadoes," as the author calls it.) To many of the ships Mr. Clark mentions, Barbados was a regular port of call. We were the last to talk to the officers of the ill-fated *Cyclops*, and among the first to hear the stories of the passengers and American officers and men traveling on the more fortunate *Uberaba* after its escape from the *U-140*. I received many detailed accounts of how the women passengers rushed, with handfuls of jewels, to our sailors who, through their gallant efforts and efficient training, had saved the ship.

The fact is obvious that these submarine forays tied up many antisubmarine craft which could have been utilized to advantage in European waters. This situation reverts to the eternal question of numbers, a subject so poignant at this moment, and one certainly beyond settlement by the layman.

The author has tactfully evaded the rôle of strategist, leaving definite conclusions to be drawn by Admiral Strauss in his able "Foreword":

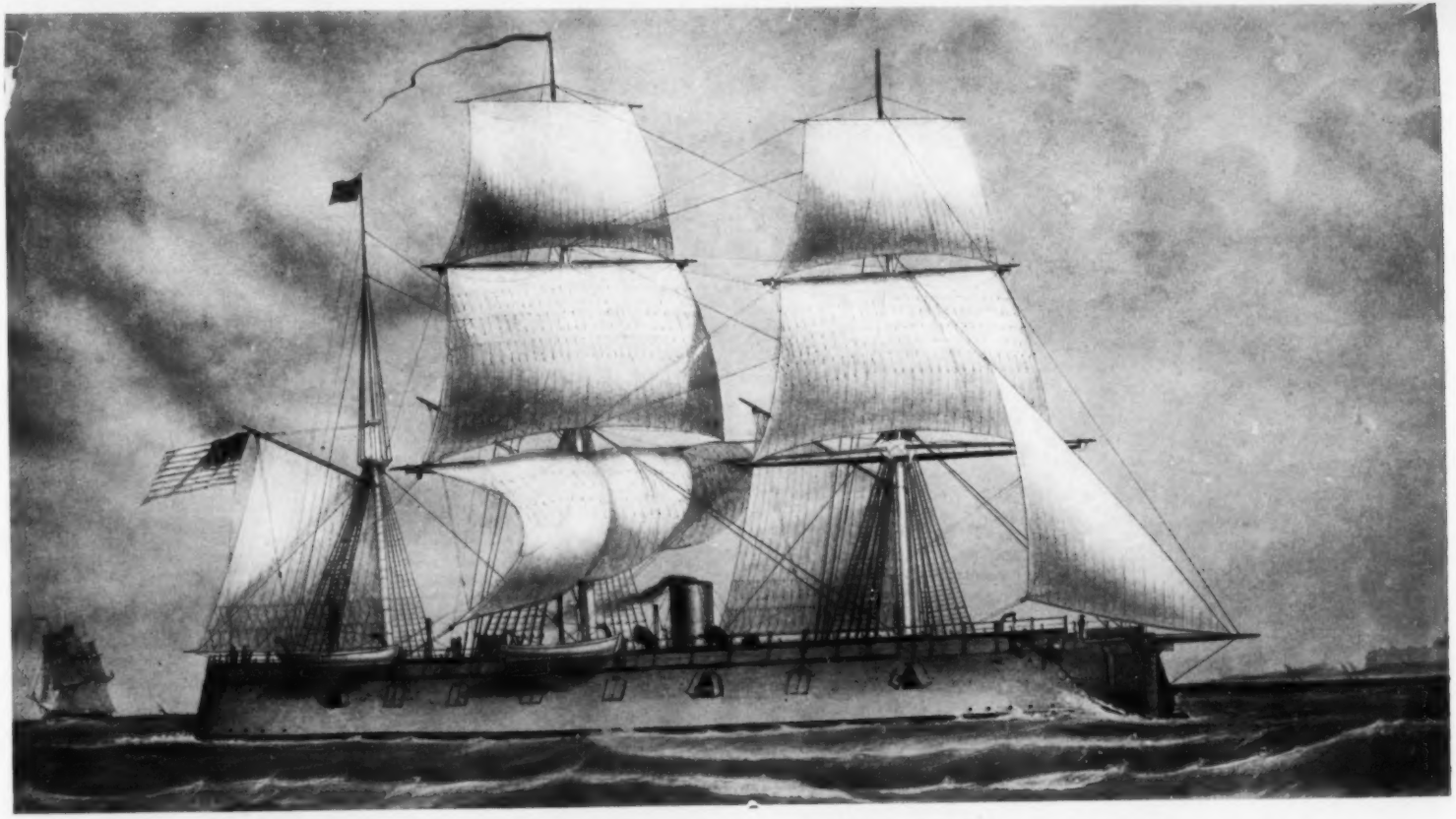
> If the enemy had possessed more long radius submarines and detached them for this service, the rate of toll would have vied with that extracted from Allied shipping as a result of the intensive submarine operations in European waters. *There lies in this history a warning to us not to withhold in time of peace the preparation of means to avert this threat.*

THE BROKEN TRIDENT. By E. F. Spanner. London. Published by the author (9 Billiter Square). 1929. 3s. 6d.

REVIEWED BY BROCKHOLST LIVINGSTON

This is a new edition of an imaginative tale of a war of 1931 in which, as the author writes in his preface, "Great Britain is brought to her knees without a foul blow being struck by either side." It is Jules Verne and H. G. Wells combined with a smattering of Bywater's technical knowledge. It is fiction pure and simple, but in unfolding his account the writer has brought up many questions which would bear investigation, for in the brain of the fictionist are born many of the inventions of the future.

While the outlook for the surface ship is not rosy in Mr. Spanner's estimation, one questions whether it would be within the realm of human capability to devise the means which England's treaty-limited opponent does in this book to combat the naval forces of the "mistress of the seas." Despite the fact that the book is light reading, it causes one to ponder on the future of war in its new element, the air.

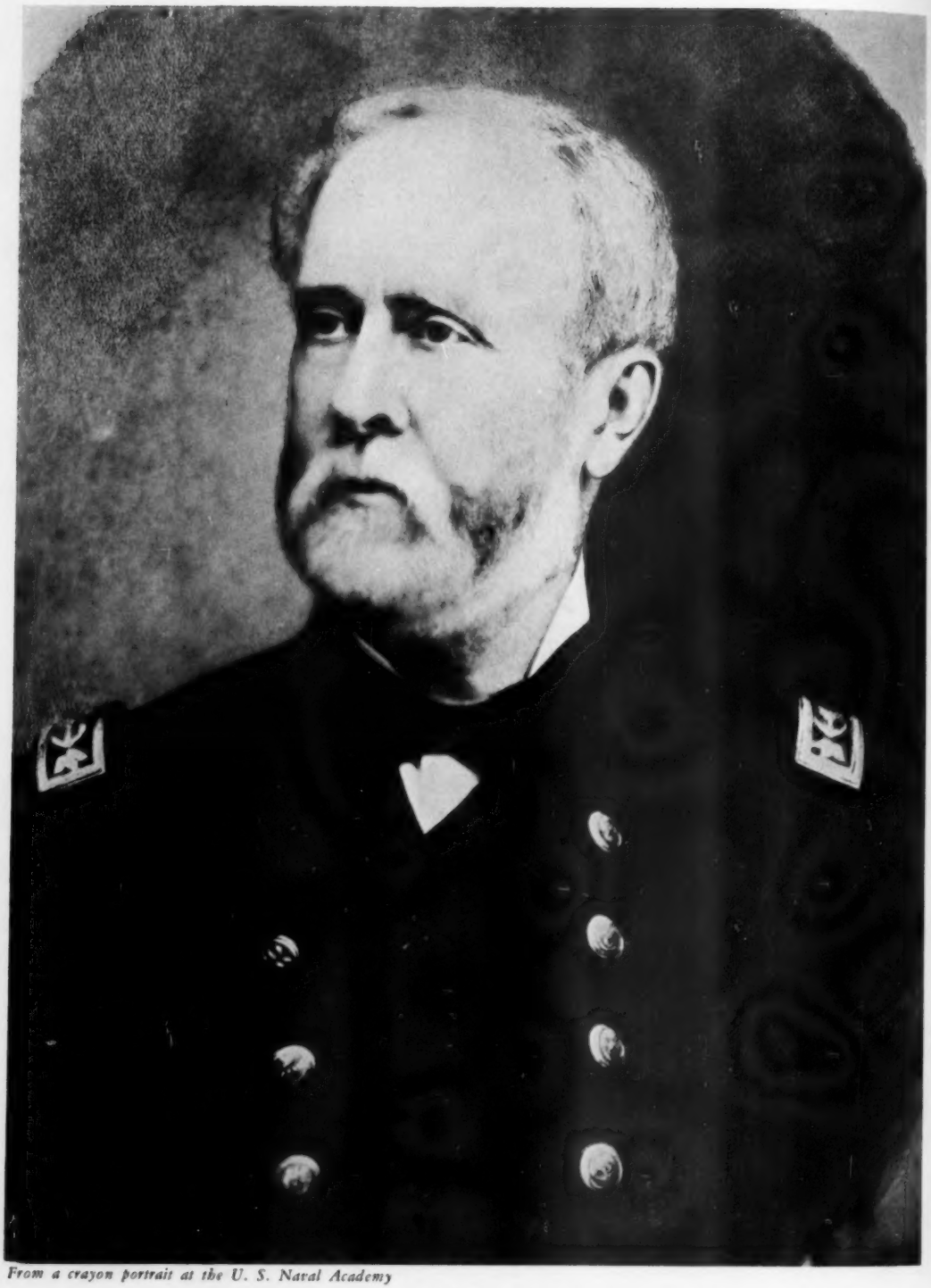


UNITED STATES IRONCLAD STEAMER *NEW IRONSIDES*

Her characteristics were: displacement, 4,120 tons; length, 232 feet; breadth, 57½ feet; draft, 15 feet. Broadside armament: fourteen 11-inch smooth-bore guns and two 150-pound Parrott rifles. Her wooden frame averaged 20 inches in thickness, and iron plates 4 inches thick covered 170 feet of her length. Her spar deck was covered with 1-inch iron laid over 3½-inch pine.

Rear Admiral (at that time a Commander) C. R. P. Rodgers was fleet captain, commanding the *New Ironsides* in the attacks on the forts defending Charleston, April 7, 1863.

UNIV. OF MICH.



From a crayon portrait at the U. S. Naval Academy

REAR ADMIRAL C. R. P. RODGERS, UNITED STATES NAVY
The third and sixth President of the United States Naval Institute

Admiral Rodgers was twice President of the United States Naval Institute, the first time 1875-1878; and the second, 1882-1883.

SECRETARY'S NOTES

Patience

The keynote for the people of the United States during the period of the London Conference is patience. The head of our delegation has asked that we be patient and coöperate.

The Navy will have to exercise the greatest amount of this valuable trait, for the Navy is most deeply affected. It will call for the maximum of self-control.

Only one group of persons will be in a position to see the complete picture of the conference, that is, our delegation and their naval advisors. They will be able to see all the angles of the subject, will hear the claims of the interested nations, will have to make the decisions. It will all appear more or less muddled to those not present at the conference in positions of responsibility; we will have to depend upon the good judgment of our delegates and be patient.

Cheer up! The Navy has been through worse crises. We've had our ups and downs, but we are never dull.

The Institute business for 1929

The annual meeting of the Institute will be held this month, but we can give a general idea of the business of the Institute for 1929 at this time.

The net increase in membership was about 460 and our total circulation as of January 1, 1930, is 7,500. This is a fair increase but not as good as we had hoped. Maybe we will do better next year; we will if the members lend a hand and send in nominations. You were very good about this last year, but try to do better this year.

During the last year we published seven new books and reprinted twelve books (this includes the so-called pamphlets). All told, we printed about 35,000 copies.

Our operating loss for the year was about $500, a little less than last year in spite of the fact that we allowed a discount of 10 per cent on Naval Institute publications to our members. So again we are serving our members at cost. Income on bonds and bank deposits brought a net profit to the Institute for the year of about $8,500.

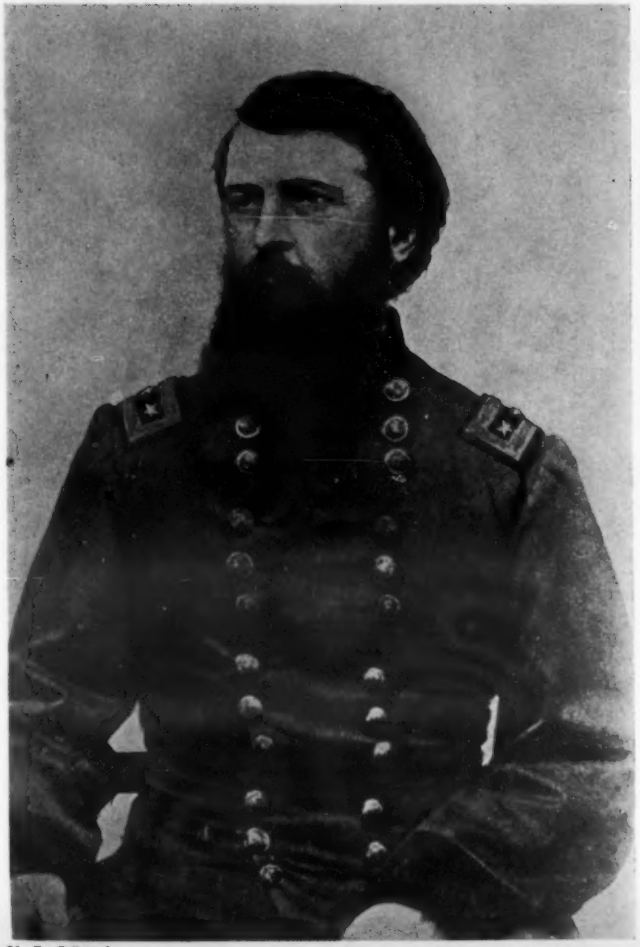
A full report of the year's business will be published in a near issue.

Prize Essay Contest

The Board of Control is now considering the relative merits of the prize essays submitted for this year. Their decision will probably be announced at the annual meeting in February.

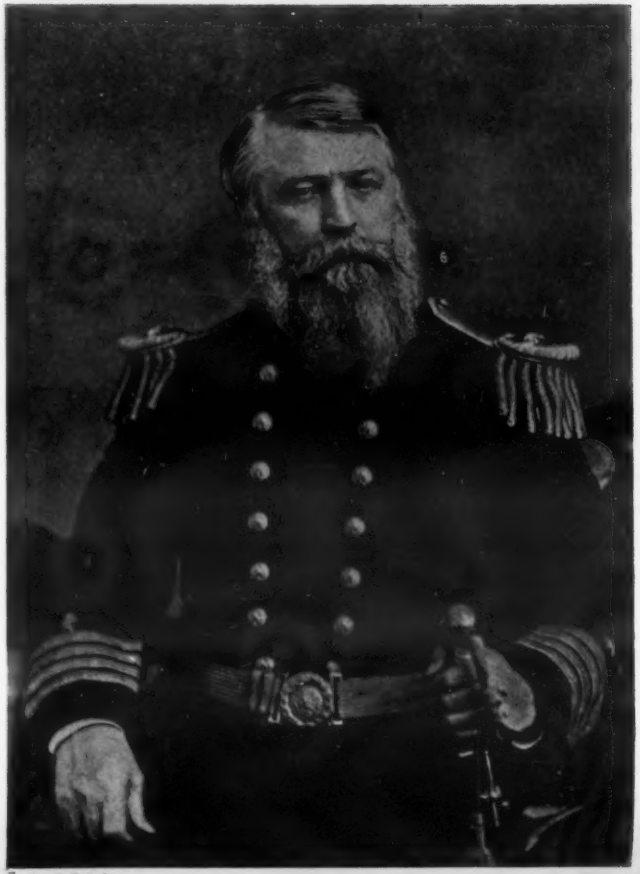
A new book

Some years ago, the Naval Institute published a very popular book, *The Watch Officer's Manual.* This book has been out of print for some time, but there has been such a demand for some such sort of book that the Institute is having prepared a new book on the same subject.



U. S. Official

SAMUEL POWHATAN CARTER AS A CIVIL WAR
MAJOR GENERAL



U. S. Official

REAR ADMIRAL SAMUEL POWHATAN CARTER OF THE
UNITED STATES NAVY

It will be of pocket size, about like *Naval Leadership,* and, in addition to the many useful things a watch officer should know about standing a watch on deck, at sea and in port, will contain colored plates of national and personal flags, merchant flags, etc.

The book will be useful to any person wanting a smart ship, if he be a man-of-war's man, a yachtsman, or in the merchant service.

We will let you know more about this book in the near future.

On land and sea

Rear Admiral H. C. Dunn, U. S. Navy, kindly called our attention to an article which appeared in an issue of the *Princeton Alumni Weekly* of October 11, 1929, concerning a member of the Princeton class of 1840, Samuel Powhatan Carter. The editor of the Princeton paper kindly permitted us to publish this article as well as lent us the two illustrations appearing on the opposite page. We are sure it will be of great interest to readers of the PROCEEDINGS as Samuel Powhatan Carter was also the eleventh graduate of the U. S. Naval Academy. The article follows:

"During the course of an examination of some old records of the War Department last summer a unique record in the annals of the military service of the United States came to light. It was that of Samuel Powhatan Carter, a member of the Princeton class of 1840, and the only American who ever held, in the course of his career, commissions as a Major General in the Army and as a Rear Admiral in the Navy.

"Carter was born in Carter County, Tennessee, on August 6, 1819. He came to Princeton in the fall of 1838 and entered the Sophomore class, remaining for only a single year. Instead of returning to complete his last two years and thus receive a Princeton degree, he rounded out his academic career at Washington College in his native state, there being granted his A.B. in 1840. In this latter year he was appointed a midshipman in the United States Navy, and after a course of training he was promoted Passed Midshipman from the naval school at Philadelphia in 1846. Almost immediately he was called to the colors at the outbreak of the War with Mexico, in the course of which he received his baptism of fire in the taking of Vera Cruz.

"In 1847-48 he was attached to the United States Naval Observatory at Washington, and three years later we find him serving as assistant instructor in the United States Naval Academy. He was promoted Master there in 1854, and the following year, Lieutenant. That same year he was ordered to the U.S.S. *San Jacinto* on the Asiatic squadron, and during the course of his two years' duty at that post he participated in the taking of the Barrier forts in the Canton river.

"Returning once more to shore duty, he was again attached to the staff of the Naval Academy, serving there as an assistant instructor in seamanship from 1858 to 1860. Then with the outbreak of the Civil War there came an important turning point in Carter's career as a warrior under his country's colors. On July 11, 1861, he was ordered on special service with the army in East Tennessee, and for a number of years which followed he was an army man instead of a member of the naval forces with which he had for so long been identified.

"On September 16, 1861, Carter was commissioned Acting Brigadier General with the Union Army—a thoroughly military assignment—and as such he distinguished himself for his gallantry in engagements at Wildcat, Kentucky, in the latter part of 1861 and at Mill Spring in early 1862, and also in the capture of Cumberland Gap by the Union forces. Carter was promoted to the rank of Brigadier General on May 1, 1862, was Provost Mar-

U. S. Official
REAR ADMIRAL SAMUEL POWHATAN CARTER OF THE UNITED STATES NAVY

U. S. Official
SAMUEL POWHATAN CARTER AS A CIVIL WAR MAJOR GENERAL

shal of East Tennessee during 1863-64, and was brevetted Major General of the United States Volunteers on March 13, 1865. He commanded the left wing of the Northern Army at Kingston, North Carolina, in the action on March 10, 1865, and later defeated the Confederates at Goldsboro.

"Although he was not mustered out of the Army until January, 1866, he lost no time after the close of the Civil War in resuming his connection with the Navy, returning to sea duty in 1865 and being promoted to the rank of Commander on June 25 of that year. From 1869 to 1872 he was the Commandant of the United States Naval Academy and was made a Captain early in this period of his service.

"Carter was a member of the Lighthouse Board for a thirteen-year period ending in 1880. He was made a Commodore on November 13, 1878, and was retired from active duty in the Navy on August 6, 1881. He was then honored by promotion on May 16, 1882, to the rank of Rear Admiral on the retired list, this reward coming as a fitting climax to an extraordinary career.

"'Admiral General' Carter died at the nation's capital on May 26, 1891, his seventy-second birthday being at the time less than three months distant."

Conqueror of the Poles

The frontispiece for the January issue of the Proceedings failed to keep up with the speed of Admiral Byrd. When it was prepared and sent to our printer, we had expected that it would be published just prior to Byrd's supreme effort. But he stole a march and beat us to it; Congress, with almost as much speed, made Commander Byrd a rear admiral on the retired list, and again we were left at the post.

Like Colonel Lindbergh, Admiral Byrd is too well known to be injured by mistakes in any *Who's Who*. Byrd's conquest of both Poles, together with his flight across the Atlantic under the most trying conditions, proves him to be a man of courage and ability.

Register of Graduates, U.S.N.A., 1929 edition

The secretary of the Naval Graduates Association asks that we inform our readers that the 1929 edition of the *Graduates Register* can be obtained from him for one dollar a copy, postpaid. Address: Lieutenant Commander R. S. Robertson, U. S. Navy (Retired),

2034 Allen Place N.W.,
Washington, D.C.

The Coast Guard Cutter "Bear"

Recently we received a very beautiful colored print of the *Bear*, made from a painting by Mr. C. R. Patterson. The picture is printed on very heavy paper, designed especially for framing. The picture itself is sixteen by twenty inches, with a three-inch white border.

A limited number of these reproductions have been made and numbered serially. They are being sold for $5.00 each, the proceeds to be applied to the Coast Guard Academy athletic fund.

Address: Picture Fund, Coast Guard Academy, New London, Connecticut.